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##### THE MEXICAN RIDDLE.

**D**URING THE LAST EIGHT YEARS Mexico has been more or less a land of mystery. All manner of conflicting rumors regarding the political and economic situation have come forth from that country of revolution and counter revolution. Accurate reports have generally been lacking, but it is well known that gross injustices have been committed upon American citizens and against American property rights which have brought about a virtual paralysis of American enterprises of all sorts in that country and have necessitated the abandonment of vast acreages of rubber and various agricultural products.

With the formation of the National Association for the Protection of American Rights in Mexico and the organization of a concerted effort to remove the causes of friction between the United States and Mexico, the public will hear more accurately of developments below the Rio Grande, and there is hope that something worth while may be accomplished.

Political affairs appear to be nearing a crisis in Mexico, and it is believed either that the Mexican people

will stabilize conditions sufficiently within a year or two to give adequate protection to foreign capital and industries, or that it will be done for them. Mexico has much that the world needs badly, and it is reasonable to suppose that the world will secure these commodities through intervention and the establishment of a protectorate, if necessary to ensure stable conditions.

Meanwhile far-sighted Americans will cultivate closer social relations with the better class of Mexicans; study their needs and customs and lay the foundations for future business, for not in years has the sentiment of large Mexican commercial interests been so favorable to better business relations with the United States.

##### SIMPLIFIED CHEMICAL NAMES.

**T**HE RUBBER INDUSTRY welcomes the determination of the Council of the American Chemical Society to confer with the Chemical Society of England and the Society of Chemical Industry in an effort to promote uniformity in the names of chemicals and their spelling and pronunciation in the interest of clarity and for the purpose of facilitating commerce and industry.

Until recently the rubber industry has been relatively free from names of troublesome length and difficult pronunciation. With the advent of organic accelerators, however, which followed in the train of synthetic rubber experiments, came many new chemical names formidable enough to stagger anybody other than a chemist familiar with their derivation and meaning. For example, par-nitroso dimethylaniline, hexamethylene tetramine, thio-carbanilide and paraphenylenediamine are a few of names of commonly used organic accelerators. Whatever indicative value such names may have for the analytical chemist, they are certainly a nuisance to the practical rubber man and the purchasing agent, and suitable shorter equivalents for everyday use are desirable.

##### EMPLOYING THE DISABLED SOLDIER.

**E**MPLOYING OUR SOLDIERS disabled in the late war and making them self-supporting and self-respecting is a theme frequently enlarged upon and which is worth while emphasizing again. The president of a large rubber company has set an example to which the attention of all is respectfully called. In seeking a solution of his own labor shortage, he instituted a careful analysis of every process in his factory. A card record was made of each operation in which a cripple could be used, and special mechanical arrangements of a simple and practical character were designed to facilitate the work and to overcome the disablement.

Many lines of employment were found open in electrical lines also, and the particular jobs in which disabled men could be used have been carefully listed. Over 80 per cent of the men injured in the great war have been provided for by the Allies and what has been done abroad

can certainly be accomplished here. Of this number the British declare that fully 60 per cent of injured men had been reinstated in their old positions. The results of rehabilitation are declared to have been satisfactory in most instances.

#### SENDING THE FOREMAN TO SCHOOL.

A TIMELY AND INVALUABLE SUGGESTION for the improvement of the human factor in large manufacturing plants has been made by John Calder, M.E., in an address before a editorial conference in New York City. In brief, Mr. Calder advocates a systematic course of instruction for foremen, and supports his suggestion with logic that should appeal to every thinking employer. He said in part:

"We now know that human engineering, tackled in spots only, such as safety, welfare and employment, has been, as a whole, neglected in industry where it counts most. . . . The foreman's education has been sadly neglected and yet he is the man, and the only man in authority, who makes contact with our workmen through half of their walking hours. . . . Not only must we cultivate more intensively in every plant and industry the modern production methods now highly elaborated, but we must set about to greatly enlarge the intelligence of those who must carry out these methods, namely, the foremen, the non-commissioned officers of industry. This is of great importance. No ideas are of much lasting benefit in any plant unless they are well told to the foremen and only a mere fraction of the present-day literature on how to analyze and handle the human factors in industry is intelligible to the foreman who must do this work in detail."

Mr. Calder then relates how courses of instruction for foremen and heads of departments begun a few months ago now number several thousand men, devoting themselves to this class of study for three months at a time.

"Sending the foreman back to school at the expense of the employer is a new idea to most owners, who have been willing to spend money on things much less worth while," he says. "But if that school is held in an employer's own plant, aims at a definite objective and makes a family party of the occasion it is found to be a most fruitful source of enlightenment and enhanced good will. . . . The art of management and supervision has been well worked out to date, so far as the chief executives are concerned, and it calls for an ever-increasing and high order of ability. It has sometimes been inclined to belittle the foreman and at other times to ignore him. Yet we have a fair supply of good managers to-day and are calling loudly not for them or for advisory engineers, but for competent foremen, not merely to criticize but to supervise successfully and to 'deliver the goods,' with the only kind of help now available, at a cost that makes good business and with due regard to the aspirations and interests of labor.

"It is to discover this man in each plant, to develop him where known, to create an interest in his job and to retain that interest, both in it and in his employes, that this educational movement has been specially prepared and offered as something new and necessary at this epoch in our industrial history."

#### BRITISH INSTITUTE OF PATENTEES.

THROUGH THE ORGANIZATION of a body to be known as the Imperial Institute of Patentees, British patentees and patent owners hope better to guard their interests and to effect desirable modifications in existing patent law. Among its objects are to procure an extension of the life of those patents which have been held up during the war by controlled firms; to assist patentees who have failed to find other support, and to reduce the high cost of a British patent, which is \$500 for a term of fourteen years as contrasted with \$35 for a 17-year patent in the United States.

The new organization has the support of the National Union of Manufacturers, the Federation of British Industries, the Associated Chambers of Commerce, and others interested in better patent laws, and would seem to be in a position to accomplish much in the interests of British manufacturers that will facilitate reconstruction in Great Britain.

#### FOREIGN TRADE-MARKS SAFEGUARDED IN JAPAN.

A DECISION OF GREAT IMPORTANCE to exporters everywhere is that of the Supreme Court of Japan, in a suit instituted by a Philadelphia manufacturing company for the protection of its trade-mark rights, which upholds in every essential and without qualification the validity of American trade-marks properly registered as guaranteed under Japan's treaty with the United States. It also protects trade-mark owners in every country having similar treaty agreements with Japan against native infringement.

This decision, epochal in world trade and exemplifying international fair play, places the spirit of Japanese law on the highest plane and favorably affects manufacturers whose annual product runs into billions of dollars. By this act Japan has benefited herself immeasurably, for safeguards against the forgery and plagiarism of trade-marks have great significance in international trade. Good-will has a higher commercial value today than ever before in history.

WEARERS OF RUBBER SHOES IN MOSCOW, RUSSIA, MUST pay to the local Soviet a tax of 20 rubles (\$10.30) per pair. The shoes cost the victim 300 to 400 rubles (\$154.50 to \$206). No doubt there is a law compelling the bourgeois to wear them, else there would be small tax returns from this item.

## Salvaging, Sorting, and Stripping Tires.

**T**HE VAST NUMBER of automobile tires discarded by the motoring public includes a notable percentage capable of yielding considerable additional mileage at low cost when rebuilt. In fact, the business of tire rebuilding is becoming nation-wide in extent and increasing in volume. The great unrepairable mass of old tires contains also a large tonnage of salable fabric of great value, useful for many manufacturing purposes.

The salvaging operations on rejected automobile tires provide profitable work for rubber scrap dealers who are developing it to the uttermost. The large scrap dealers are specializing extensively in automobile tire scrap. It is their business to receive old tire stocks from the collectors and sort them into the recognized grades of the waste rubber market. These are officially described in the circular E of the National Association of Waste Material Dealers and listed in the order of their relative value. (See THE INDIA RUBBER WORLD August 1, 1919, page 658.) The

grades and current prices are: standard white auto,  $5\frac{1}{2}$  cents; standard mixed auto, 5 cents; stripped, unguaranteed,  $4\frac{1}{2}$  cents; white G. & G. (Goodrich and Goodyear),  $5\frac{3}{4}$  cents; white M. & W. (Morgan & Wright) and White, U. S.,  $5\frac{1}{2}$  cents.

### SORTING OLD TIRES.

Sorting old tires is not a highly specialized operation but a simple matter of skill in inspection and quick individual handling. The most expert sorting is picking out guaranteed makes suitable for rebuilding which means selection of tires with perfect beads, only minor defects of fabric, a limited number of small blow-outs, and no rim cuts or loose plies.

Repairable tires are graded into No. 1 inners, which are good stripped carcasses; No. 2 Inners, containing only a single blow-out; and the ordinary repairables with more than one blow-out. Repairable tires are sold on a graded price-list according to damaged condition, the price running from 8 to 15 cents per pound. All unrepairable tires are subjected to the processes of dissection for salvage of fabric and separation of the various rubber scrap qualities used by the trade.

### BEADING OLD TIRES.

The first operation is the removal of the bead from the casing. This is quickly accomplished in a simple machine known as a bead trimmer.

The tire is thrown over the machine and rests on a series of rollers. On one side it is slipped over a crowned roller which fits the inner surface of the tire, while on the outside at the corresponding point is a circular knife. Pressure on a foot treadle revolves the tire by action of the crowned roller inside the tire and sends the circular knife downward through the tire sidewall just above the bead, which is rapidly severed, allowing its removal by the operator. The tire is reversed and by repetition of the operation the other bead is removed.

From the beading machine the carcass passes on to receive preparation for the operation of pulling out the fabric plies. This preparatory operation is starting the plies by hand.

### STARTING THE PLIES.

The conveniences for starting the plies of a bead-free tire carcass are extremely simple. They consist of a stout timber about five by eight-inches and two feet long, supported horizontally

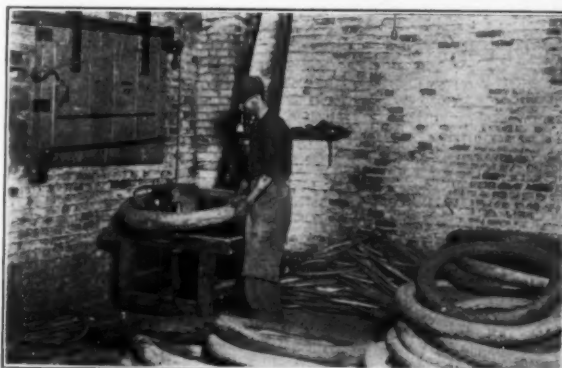
at a convenient height for working. The tools consist of a screw-driver with a short blade, a short knife with the point curved after the manner of a pruning blade, and a heavy pair of ordinary hand-nippers.

The stages of the work of starting the plies are shown in succession in the illustration, beginning in the background. The

worker places the carcass upon the beam or support, then depresses it as he turns it half inside out near the blow-out. Next he holds it securely in position on the support by resting a portion of his weight in the lower loop of the carcass, while with the point of the knife he cuts through the number of plies, three for example, which are to be started up for stripping. The cut is made near the blow-out and the plies separated across by means of the screw-driver. Once started, they are pulled back with the nippers a distance of about a foot. Following this the carcass is cut apart at a point just beyond the blow-out and is thrown aside ready for the pulling machine.

### PULLING FABRIC STRIPS.

There are various machines used for pulling tire fabric from the carcass. They comprise means for holding the tire and for seizing the free ply-end, also a power connection to effect the separation. Some pulling machines are arranged to separate the plies in long lengths from the endless tire, and others operate on cut tires. The one shown in the illustration is of the latter type.



(The Loewenthal Co.)  
CUTTING BEADS FROM TIRE CASINGS. A PARTLY SEVERED BEAD IS SEEN CURVING UPWARD FROM THE CIRCULAR KNIFE, AND IN THE BACKGROUND IS A PILE OF CUT BEADS.



(The Loewenthal Co.)  
STARTING FABRIC PLIES. THE SUCCESSIVE STEPS MAY BE NOTED FROM LEFT TO RIGHT IN THE PICTURE, COMPRISING REVERSING THE TIRE, CUTTING, AND STARTING THE PLIES TO BE PULLED.



By suitable power transmission a proper ratio of speed is obtained between the pulling elements, one of which hold the end of the tire while the other serves as a wind-up for the separated fabric. The fabric, as pulled, winds in a roll on the pulling spindle from which it is easily removed. A convenient arrangement enables the operator to stop and reverse the mechanism whenever necessary, for he is obliged to pull up by hand an adhering bias end. The machine is actuated by a foot treadle



(The Loewenthal Co.)

PULLING FABRIC FROM TIRE CARCASSES. THE TREAD STOCK WINDS ON THE DRUM WHILE THE PULLED FABRIC WINDS ON THE SPINDLE, EACH IN OPPOSITE DIRECTIONS. THE PRODUCTS MAY BE NOTED ON THE FLOOR AND IN THE BASKETS.

and is speedy in operation. With such a machine a skilful workman can strip 25 or more tires per hour, producing practically 1,000 pounds of pulled fabric per ten hours.

The auto treads from which all but one or two plies have been pulled are designated in the scrap rubber trade as "Auto Tread Stock" or "Dyke's Peelings." This is sorted by quality and color the same as the original tires and stored preparatory to baling for shipment to the rubber reclaimer.

Machine-made tires permit separation of single plies in continuous length from uncut tires. Wide pulled fabric is obtained by cutting away the edges of the tire beads and removing the plies full width, pulling out the bead cores as they are exposed in the process. Fabric of this sort is especially adapted to tire rebuilding purposes because of its width.

#### STRIPPING TIRE BEADS.

Tire beads, cut from the tires as described above, contain a core of wire or hard rubber surrounded with rubberized fabric. The latter has distinct value and is removed for rubber reclaiming purposes. Hard rubber bead cores, ground fine, are used as a filling in low-grade small molded rubber goods, mats, matting, etc.

#### STRIPPING BEAD FABRIC.

The bead circles from the bead trimmer are cut once preparatory to prolonged boiling in a tank of water or live steam, where the grip of the fabric on the core is loosened. The stripping could be done by machine, but ordinarily is accomplished by hand power.

A workman with pliers frees the fabric from one end, placing the exposed core or center in the grip of a pair of tongs hanging overhead, and by direct pull strips down the covering material of fabric and rubber, known as "coreless beads."

#### GRADES OF SALVAGED RUBBER AND FABRIC.

A descriptive list of qualities of rubber and fabric salvaged or dissected from discarded automobile tires follows:

##### REPAIRABLE TIRES.

**STRIPPED AND ROAD-WORN TIRES.**—Casings as rejected by the motorist. They are valuable chiefly for the friction rubber reclaimable.

**BEADLESS TIRES.**—Beaded but not stripped.

**No. 1 PEELINGS.**—Rubber stock free of fabric cut by hand from tread and side walls.

**No. 2 PEELINGS.**—Similar to No. 1 peelings, but containing breaker and some building fabric.

**AUTO TREAD STOCK (DYKE'S PEELINGS.)**—The fabric carcass minus beads and three or four plies of salvaged duck plies.

**CORELESS BEADS.**—The material stripped from the cut beads.

**GROUND BEAD CORES.**—This stock is no longer valued and has dropped from the market because of its low grade.

**BUFFINGS.**—This is a by-product produced in the manufacture of new tires and inner tubes, and in the operations of tire repair men.

**PULLED AUTOMOBILE FABRIC.**—Single or multiple-ply as specified. This is a recent development and is extensively used in rebuilding and repairing tires, and the manufacture of tire boots or patches and reliners; also in the manufacture of a variety of small rubber articles where strong fabric is required.

Pulled tire fabric is now an important item of supply in the automobile tire accessory, tire repair and rebuilding trades. Reliners and blow-out boots made up from sound pulled fabric, properly prepared, are recognized as equal in serviceability to such articles produced from new fabric. The extensive demand existing for this merchandise made from salvaged fabric has induced some members of the large scrap rubber organization to specialize in its manufacture in addition to the work of salvaging.

#### CONCLUDING RETROSPECTION.

Salvaging fabric in scrapped goods is by no means new. Thirty years ago a mechanical goods factory stripped the fabric from scrapped hose, dipped it in cement and made it up again into garden hose which sold at a very low price.

So, too, both the English and the French have devised processes for using finished fabric either with its rubber content or without. French rubber chemists, for example, devised processes for removing the rubber in scrapped tire carcasses without injuring the fabric. One process, the De Villers, consists in treating the rubber-impregnated fabric with boiling hot tetrachlorethane in two stages, together with the intermediate use of a filter press to separate the fabric from the rubber in solution. The fabric is practically free from rubber and used in the manufacture of various small articles for which cotton duck is used.



(The Loewenthal Co.)

STRIPPING TIRE BEADS. BOILED, HOT, CUT BEADS FROM THE TANK AT THE LEFT ARE READILY STRIPPED FROM THE CORES AND FORM THE PILE AT THE RIGHT.

In another process, the Debaugé, the rubber-impregnated fabric is treated three times with xylol subjected to heat and powerful agitation in vacuum to dissolve the rubber, the cloth after each treatment being placed in a washing machine with cold xylol to remove rubber particles still adhering to it, also resin and free sulphur, and is finally rinsed and dried in a current of warm inert gas.



## Better Rubber Trees.

By J. P. Romein.

Now that hundreds of thousands of acres have been planted with *Hevea* rubber and have come into bearing, the mistakes made in the beginning come to light. That mistakes were made is not surprising, considering the feverish haste in which this planting was done. The directors and investors were probably not familiar with the principles underlying agricultural enterprises and expected only as speedy returns as possible, on the money invested. At the time of the rush not enough technically trained men were available to take care of the new undertakings, and as a result we now have to face many problems which would not have come up had the foundations been properly laid. Some of these mistakes can be remedied, others cannot, except by cutting down the whole plantation and starting anew. While in the end this might pay, stockholders and investors naturally are loath to chance it, especially as every well-managed plantation brings in a substantial dividend as it stands. But with keener competition and diseases demanding more attention, it is imperative to any company undertaking new plantings to avoid the mistakes made in the past.

Luckily the scientific side of the industry is gaining recognition and confidence by the practical planter. Yet today it is practically only the question of diseases which receives attention, while the more important point of correct planting is neglected nearly as much as it was in the beginning of the planting industry. I call this point more important because the matter of diseases does not demand attention until after the plantation has been well established, while the trees, once planted are there to stay. Now and then something has been said about breeding a better strain of *Hevea*, and seed selection has been given some consideration but no serious attempts have been made to improve the situation.

### A SIGNIFICANT COMPARISON.

To make clear the faults of the present system of planting, I should like to compare a rubber plantation to an orchard. Following the same methods as those employed in planting *Hevea*, the procedure in an apple orchard would be as follows:

A number of apples would be gathered, composed of perhaps two hundred varieties, good and bad. The seeds would be taken out and the soundest ones selected and planted in a seed-bed. After a set time a number of seeds would germinate and these would be planted, discarding all the rest. In planting, the young trees would be planted, say 9 by 18 feet. When, after a number of years, the trees began to bear, they would be found to be too crowded and half would be thinned out. Selection as to the merit of the fruit would be carried out as far as possible without disturbing the planting distances too much.

How soon would a fruit farmer be in the poorhouse if he followed the above method? And why are our rubber plantations planted in exactly that way? Because they pay dividends as it is, or because it was always done that way?

### RUBBER GROWING IS MORE HORTICULTURE THAN FORESTRY.

Some persons contend that a rubber plantation cannot be compared to an orchard, that it should be treated as a forest. I think that many mistakes in planting find their origin in this conception. The problems of the rubber planter are not those of the forester, but those of the horticulturist or agriculturist. In such an intensive culture as that of *Hevea* the tree must be treated as an individual and not all the trees as one collective unit. The matter of diseases is one for the mycologist to deal with; improving the race is for the physiologist or the horticulturist to consider; in short, all the problems encountered by the man who has an orchard are the same as for the rubber

planter. The fact that an orchard measures perhaps one hundred acres and a rubber plantation one thousand or ten thousand makes no difference. Unless each tree is given proper attention and made the best there is, the whole cannot be satisfactory.

Upon superficial inspection a rubber plantation looks very much like an orchard planted from seed. The size and markings of the seeds, the size and color of the leaves, the mode of branching, the appearance of the bark, etc., are some of the more obvious differences. And that this variability applies to the much more important factor of yield is known to every planter. The following figures, obtained during the course of an extended experiment, show the extent of this. Of 250 trees, the dry rubber yield of which was measured daily, the lowest yielder gave 16 grams while the highest gave 342 grams during the same period. These trees were taken at random, but the average for the whole lot was the same as that for the entire plantation, namely 66 grams. Now, if only trees of the type yielding 342 grams were planted in the beginning, the production of the plantation would be five times that of today. Is there any company which cannot afford to wait an extra year if necessary to make proper preparations?

I do not mean to attack the selective thinning methods advocated by progressive planters; the more systematically this is done the better. The best practice is not to plant inferior trees to begin with, so that later on selective thinning will be unnecessary. The argument that a newly formed company cannot wait any longer for rubber than is absolutely necessary is like arguing that a new factory should be erected without foundations because that will hasten production by six months.

### PRINCIPLES GOVERNING STOCK SELECTION.

Then how should better planting stock be obtained? Before answering this question, I would like to point out the guiding principles which should govern the selection of stock. These principles concern:

1. Yield.
2. Disease resistance.
3. Quality of the rubber.

**YIELD.** Besides being dependent upon external conditions, such as physical and chemical conditions of the soil, climate, and the like, the yield is an inherent character of the tree, and any amount of cultivation cannot improve it beyond a certain maximum peculiar to the individual tree.

**DISEASE RESISTANCE.** While yield has been mentioned frequently in this connection, the question of disease resistance has been scarcely touched upon. It is a well-known fact that where one strain is susceptible to disease, another is not. This holds good in the plant world as well as in the animal world. Field mice, for instance, are highly susceptible to glanders, house mice are almost completely immune; Jersey cows are more liable to tuberculosis than Holsteins; and Yorkshire swine are more resistant to swine-erysipelas than some other porcine breeds. It has come to light in the experience of every physician that members of the same family, exposed at the same time to the same possibilities of infection show greatly varying susceptibilities. Many varieties of apples and pears cannot be grown because they are sure to fall prey to some disease, while other varieties are totally immune. Practically every planter has noted that certain trees are easily infected while adjacent trees are passed untouched. The reason for this phenomenon lies in the inherent immunity to disease in the individual tree.

**QUALITY OF THE RUBBER.** No extensive work has been done regarding the variability in the quality of the rubber derived

from individual trees. Some differences among latices are very apparent, such as color and concentration of the latex, and it is more than probable that the intrinsic value of the rubber from one tree is better than that of its neighbor. For a thorough consideration of the problem this point should be given attention, though it is of less importance than the questions regarding yield and disease resistance.

#### METHODS OF IMPROVING STOCK.

The methods whereby better planting stock can be produced on the basis of the three points mentioned above may now be considered.

SEED SELECTION can never result in a uniform, highly productive plantation. The selection of seeds from trees, known to be good producers enlarges the chances that the offspring will be better yielders, than when the seed is obtained from unknown parents. But the laws of heredity show that this is nothing more than a chance, due to the number of generations of interbreeding and the cross-fertilization which takes place.

The methods for improvement based upon scientific principles present themselves as follows:

1. Breeding.
2. Seedling selection.
3. Artificial propagation.

BREEDING. In order to obtain a better strain through this method, it is necessary to isolate a single strain, which will breed true to type. Through cross-fertilization during a large number of generations, the present plantation rubber tree is of a very complex nature, and to isolate such a strain in a systematic way involves a great amount of work, to be divided over a large number of years. This is the more so because three different characteristics are involved, namely: yield, disease resistance and quality of the rubber. As a tree has to be grown for at least four years to determine the single factor of yield, it will easily be understood that the problem of breeding a really valuable strain will take more than one generation of investigators.

That scientific breeding experiments should be carried out is certain, but this should be done by the various governments concerned; for any private concern this method is entirely too costly and requires too much time for any immediate commercial purposes.

SEEDLING SELECTION. There is no way to select in the nursery the seedlings which will later develop into big producers that will be immune to disease. No morphological character is known correlated to yield. As a result of extensive experiments along this line with fully grown trees I am satisfied that shape and size of leaves, mode of branching, color and texture of bark and similar characteristics are not correlated to yield. There is a possibility that histological characters, such as distribution of latex vessels, their number or size, may furnish a clue to productivity, but as we are dealing with seedlings, these would have to be destroyed or at least seriously damaged before their value was known. While of course it is best to select the most vigorous seedlings for planting out, still this is not the solution to the problem.

ARTIFICIAL PROPAGATION. This is the method used by pomologists to perpetuate the strain or variety, which has proved valuable. The varieties of apples, pears and other fruits were originally obtained through cross-breeding, a procedure, which, for immediate results, is out of the question for *Hevea*, as has been pointed out above. For stock we have to start with the trees now on the plantation. And it is a sure fact that enough material is there to produce something much more valuable than the average we have today.

#### PROCEDURE TO BE FOLLOWED.

In order to obtain the best stock the following procedure should be followed:

1. Select a number of the oldest trees to be found, growing

under the same conditions regarding soil and climate as those prevalent on the new plantation.

The oldest trees should be selected, because they have been under observation for a longer period than the younger ones and more is known about their yield and disease resistance. They should be chosen from a locality where soil and climatic conditions are as nearly as possible the same as those on the contemplated plantation, because a certain variety may prove excellent in one soil, while it would not be in another; it may grow well at a high altitude but break down in the lowlands. The argument sometimes put forward that selecting seed from a place where conditions are entirely different from those on the new plantation will result in better trees, is entirely without any scientific foundation.

2. Of the trees selected, choose those which show no evidence of ever having been attacked by disease.

The chance for immunity to disease is greater in such trees. This of course does not mean that these trees will never contract any disease; it simply improves the chances for a disease-proof offspring.

3. Of the remainder select the highest yielders.

To determine which is the best yielder, it is necessary to measure the dry rubber yield for an extended period, preferably one year.

4. If two or more trees yield about the same quantity, the choice should fall on the tree producing the best quality of rubber.

This point is of less importance than yield and disease resistance, unless very great differences should be found in the course of the experiment.

#### METHODS OF ARTIFICIAL PROPAGATION.

These may be divided into two groups, those providing for their own root systems and those where one tree is grafted upon another. It is probable that the root system is as important to latex production as are the parts above the ground.

Methods for developing root systems include marcotting and cutting. The first method, marcotting ("tjankok"), has been successfully carried out in the experimental garden at Buitenzorg, Java. It is a laborious method, however, and should be used only if every other method fails.

Cuttings were made from the first seedlings grown at Kew Gardens and shipped to Ceylon, and it can be done again. These cuttings carry with them the characteristic root system of the parent tree. This root system is a suitable one for a good producer inasmuch as the parent tree was selected for its productivity. It is barely possible that a less perfect root system will develop from cuttings and this should be investigated. If, however, cuttings develop a good root system, this method is to be preferred above any other method of artificial propagation. It is speedy and above all simpler than grafting, and can be carried out by native labor with a minimum amount of failures.

Methods whereby a good-producing, disease-resistant variety is grafted upon another root system are numerous. One of the simplest has been carried out on a larger scale lately on one of the Sumatra plantations and has proved quite successful. This method is budding. However, when resorting to grafting the thing to bear in mind is, that not only should all possible attention be given to the derivation of the bud or scion, but the stock used to graft upon should be carefully selected. Other qualifications enter into the selection of this stock than into the selection of the bud or scion. The most important is to select young trees free from any root diseases and those with the best-developed root systems. The stock can very well be grown from seed, but none except those having the above-named qualifications should be used to graft upon.

Summarizing the foregoing paper, it is found that:

1. The present method of reproducing *Hevea* should be discontinued.

2. Breeding to obtain a better strain is, for technical reasons, out of the question for any commercial firm.

3. Seedling selection offers no solution on account of the inability to know what to select.

4. Artificial propagation will overcome the difficulty.

5. Carefully selected trees should be used for propagating stock, taking into account productivity, disease resistance and quality of the rubber.

## Reducing Waste in Rubber Factories.

*By Robert C. Kelley.*

PROBABLY in no other industry than rubber manufacturing does so large a percentage of the material used, go of necessity into scrap. For this reason it became very easy for all waste in rubber factories to be regarded as a necessary evil, and consequently little attention was paid to it other than devising means to utilize it in the product. But in these days of accurate cost finding, and with the rising expense of labor, fabric, chemicals, power, etc., rubber manufacturers are keenly interested in methods of reducing the waste item.

While in rubber-shoe manufacturing the greater part of unvulcanized proofed cloth clippings is used over again, the loss in value is a large one. Thus, a man working on the problem of keeping waste down to the minimum not only can furnish

### GENERAL FACTORY SCRAP

[illegible]

DAILY TALLY SHEET.

valuable information on costs but also can be instrumental in saving thousands of dollars in material which formerly sold for junk at a small return.

**ACCURATE INFORMATION THE FIRST STEP.**

The first step in tackling the problem is to obtain current, accurate information on the amount of scrap and its cause. It entails no additional expense to have uncured cloth scrap kept separate according to the kind of cloth and gum coating. This is collected in baskets daily and charged to the department responsible. In a factory manufacturing gum shoes, boots, tennis

shoes, tires, inner tubes, heels and fiber soles, where I have seen a salvage system in operation, the waste is handled in the following manner.

#### METHOD OF HANDLING WASTE.

All ends and trimmings from the cloth calenders in the mill room are weighed and charged against the production of each machine. This instills a sense of responsibility in each calender man to keep his percentage as low as possible.

## DAILY SCRAP REPORT

[illegible]

## WEEKLY REPORT TO FOREMEN.

Cutting-room scrap, from punching out insoles, filling soles, heel pieces, tennis quarters and vamps,—all inside work for rubbers, boots and gaiters, is handled directly by that department on a percentage basis as part of the individual cutting records. Many of the cutters are paid piece work rates on a sliding scale, a higher rate being paid for a low percentage of scrap, but to be successful in operation this system must be made fool-proof. All scrap from the cutting machines and hand cutters is tagged with a distinctive mark to prevent its becoming confused with the general factory scrap.

All other waste from the cutting room, such as sweepings, defective pieces thrown out in putting up the work, pressed or wrinkled leg covers and boot vamps from the rolling machine, holes in the fabric, etc., are charged to the department at fault. Bad heels are examined to determine the number due to poor press work, low pressure, bad trimming, or poor stock. The same policy is maintained throughout the plant. Thus, on the stitching room report is found the amount of tennis duck scrapped in stitching, and on that of the quarter or cement department the percentage of stock spoiled in being prepared for the boot or gum shoe teams.

In the making departments the makers at the end of their day's work return all surplus pieces to the post office to be used again on the next ticket, and leave on top of their benches all defective stock or parts scrapped through their own carelessness. Scrap due to poor calendering or poor cutting is sent out with the waste of the milling or cutting rooms while the rest is charged to the making departments. A distinction is made, however, between legitimate ends or trimmings and unnecessary waste. All of this material is tagged, signed for by the foreman of the department responsible and collected daily.





shown on page 288 of "Rubber Machinery" by Henry C. Pearson. All linings and nets, friction stocks and cloth coated on both sides were ground up and used in a fibrous compound as a covering for inside work known as "rag." Screens of various mesh were used from  $\frac{1}{2}$  to  $\frac{3}{16}$ -inch. It was found to produce a much more uniform "rag" than the old method of running the scrap over the cracker directly, and made it possible to use up many more kinds of scrap.

Cloth used for tennis tops, which formerly had a poor sale baled up as scrap, especially the doubled or "stuck upper" which could not be sold at all, was all ground up to make fiber for fiber soles and heels. Bad heels were pulverized to be used over again in the cheaper grades. In fact, the only scrap to be sold under the new arrangement is cut shoes, tires, cured trimmings, and tube wrappings. Constant touch is maintained with the chemical laboratory which has been of valuable assistance in working out compounds to make use of scrap.

In brief, this is the system devised for handling the scrap problem in one rubber factory. That it has been successful is shown by a 2 per cent decrease in scrap which has been maintained for several months, and further reductions are looked upon not as a possibility but as a certainty.

### GOVERNMENT SPECIFICATIONS FOR BALLOON FABRIC.

AS the following specifications are subject to revision, manufacturers are advised to apply to the War Department, Air Service Engineering Division, Dayton, Ohio, for the latest rulings.

SPECIFICATION NO. 16,013-A, MARCH 25, 1919,  
SUPERSEDES SPECIFICATION NO. 16,013.

#### GENERAL.

1. This specification covers the requirements of the Bureau of Aircraft Production for balloon fabric for use in the manufacture of balloons.
2. Balloon fabric is rubberized balloon cloth.
3. Specifications Nos. 16,022-A and 16,023-B state the requirements and tests for balloon cloth and should accompany this specification to all manufacturers of balloon fabric.

#### USE.

4. Balloon fabrics of the various grades and numbers, as listed in Table 2, are intended for use in the construction of balloon parts as follows:

Type.	Part.	Fabric Number.
Kite balloon .....	Envelope .....	1 or 2
	Ballonet .....	3, 4, 5 or 6
	Lobes .....	8
	Tape .....	11 or 12
Dirigible balloon .....	Envelope .....	1, 2, 9 or 10
	Ballonet .....	3, 4, 5, 6, or 7
	Tape .....	11 or 12

5. Parallel doubled fabric may be designated in an order by adding the letter "S" to the number of the fabric.

#### MATERIAL.

6. Balloon fabric shall be manufactured from finished balloon cloth conforming in every respect to Specification No. 16,023-B.
7. The rubber coating used in balloon fabric construction shall contain the best quality rubber and the highest grade ingredients designed to give minimum permeability and the best weather-resisting qualities.

#### MANUFACTURE.

8. Workmanship shall be consistent with the best manufacturing practice.
9. Balloon fabric must not be overcured or undercured nor show excessive water-marks. The existence of any of these conditions will be

cause for rejection and will be determined by the Chief of Balloon Inspection.

10. Two-ply bias fabric shall be made up with the bias ply on the outside unless otherwise specified in the order. The bias ply shall be set at an angle of approximately 45 degrees to the straight ply.

#### SELECTION OF TEST SPECIMENS.

11. SAMPLES. A sample for tests shall be taken from every roll of fabric.
12. Additional samples for determining the uniformity of the fabric may be taken from any portion of the roll, as may be deemed necessary by the inspector.
13. Each sample taken from the roll shall be one-half ( $\frac{1}{2}$ ) yard long and the full width of the roll.
14. SPECIMENS. Tensile test specimens, each six (6) inches long and two (2) inches wide, shall be cut from each sample, parallel to the system of threads to be tested.

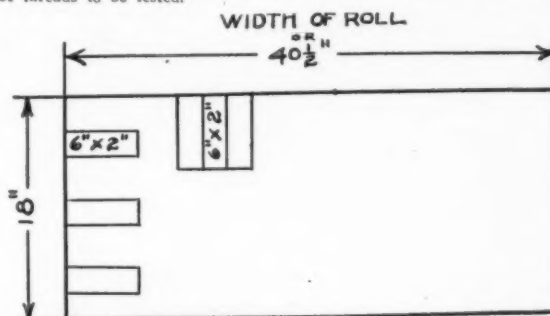


FIG. 1.

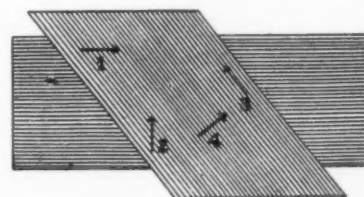


FIG. 2.

#### METHODS OF CUTTING TEST SPECIMENS.

15. Three specimens of single-ply fabric or two-ply parallel fabric shall be cut parallel to the warp, and three specimens shall be cut parallel to the filling, as shown in Figure 1.
16. Three specimens of two-ply bias fabric shall be cut parallel to each system of threads under test as indicated by the arrows in Figure 2; three specimens being cut parallel to the warp of the straight ply, three parallel to the filling of the straight ply, three parallel to the warp of the bias ply, and three parallel to the filling of the bias ply.

#### TESTS.

17. TENSILE STRENGTH TEST. The tensile test specimens, prepared in accordance with the foregoing instructions, shall be tested under existing humidity conditions.

18. The test specimens shall be tested in tension in a machine of the inclination balance type having a maximum capacity of 400 pounds.

19. The jaws of the testing machine shall be 2-1/16 inches wide and shall be three inches apart at the beginning of the test. The jaws shall separate at the rate of approximately 20 inches per minute.

20. The average breaking load of the three specimens cut in each direction shall be taken as the tensile strength of the sample which they represent. The tensile strength of the balloon fabric must be not less than that shown in Table 2.

21. PERMEABILITY. The permeability of the fabric to hydrogen shall be determined, under the following conditions, by a method and apparatus approved by the Inspection Department of the Bureau of Aircraft Production. The fabric shall remain in contact with an atmosphere of pure

TABLE 2.													
Style No.	Number and Arrangement of Plies.	Balloon Cloth (Minimum Oz. per Sq. Yd.).				Rubber Coating (Minimum Oz. per Sq. Yd.).			Minimum Weight per Sq. Yd., Ounces.	Maximum Weight per Sq. Yd., Ounces.	Tensile Strength (Minimum per Inch Width), Warp and Filling, Pounds.	Maximum Permeability, Liters per Sq. Meter per 24 Hrs.	
		Outside Ply.		Inside Ply.		Air Side.	Between Plies.	Gas Side.					
		No.	Weight.	No.	Weight.	Weight.	Weight.	Weight.					
1	2 Bias	BB	2.5	BB	2.5	0.6	3.5	...	9.1	9.7	48	18	
2	2 Bias	BB	2.5	BB	2.5	0.6	3.5	0.5	9.6	10.3	48	18	
3	2 Parallel	AA	2.0	AA	2.0	...	3.0	...	7.0	7.7	50	18	
4	2 Parallel	AA	2.0	AA	2.0	0.5	3.0	0.5	8.0	8.7	50	18	
5	1	BB	2.5	...	...	...	...	4.0	6.5	7.0	45	18	
6	1	BB	2.5	...	...	0.5	...	4.0	7.0	7.8	45	18	
7	1	DD	4.5	...	...	0.5	...	4.0	9.0	9.8	65	18	
8	1	BB	2.5	...	...	0.6	...	1.0	4.1	4.7	45	..	
9	2 Bias	BB	2.5	DD	4.5	0.6	3.5	...	11.1	12.0	48	15	
9S	2 Parallel	BB	2.5	DD	4.5	0.6	3.5	...	11.1	12.0	70	15	
10	2 Bias	BB	2.5	DD	4.5	0.6	3.5	0.5	11.6	12.4	48	15	
10S	2 Parallel	BB	2.5	DD	4.5	0.6	3.5	0.5	11.6	12.4	70	15	
11	1	{ or heavier BB	2.5	...	...	0.6	...	{ uncured 3.0	6.1	8.7	..	..	
12	1	{ or heavier BB	2.5	...	...	...	...	{ uncured 3.0	5.5	8.1	..	..	

hydrogen in the testing apparatus for at least one hour before beginning the test, this time being in addition to that necessary to replace the air in the permeability cell with hydrogen. The fabric shall be maintained during the test at a temperature of at least 77 degrees F. (25 degrees C.). A current of pure hydrogen shall be maintained against one side of the fabric for a test period of at least two hours. The hydrogen current shall be under a pressure of at least 1.18 inches (30 mm.) of water above the pressure on the air side of the fabric. Dry air at approximately atmospheric pressure shall be passed over the air side of the fabric. The quantity of hydrogen that passes through the fabric shall be determined either by burning to water and weighing as such, or by any other accurate method such as that using the gas interferometer. The permeability shall be calculated in liters of dry hydrogen, measured at 32 degrees F. (0.0 degree C.) and at 29.92 inches (760 mm.) mercury pressure. The permeability shall be expressed in liters per square meter per 24 hours.

22. The permeability of the fabric must not exceed the maximum permeability shown in Table 2.

23. WEIGHT. The weight of the fabric shall be determined under existing humidity conditions by weighing three representative test pieces, cut out of the sample with a die, each having an area of at least 4 square inches. Weights shall be expressed in ounces per square yard.

24. The average weight per square yard of at least three test pieces must not be more than the maximum nor less than the minimum limits given in Table 2.

25. LIGHT TEST. The fabric shall be run over a bank of lights and carefully examined for imperfections of manufacture, such as pinholes, uneven spreading, imperfect doubling, wrinkles and other defects.

26. Weak or imperfect parts of the fabric which have been marked on the cloth before rubberizing, or which have been discovered in the finished fabric, shall be distinctly marked on the finished balloon fabric. Sections of cloth so marked shall be excluded or patched in cutting panels for United States Army balloons.

#### MARKING.

27. Finished balloon fabric shall be stamped or marked, at intervals of two feet, with the official acceptance stamp of the Bureau of Aircraft Production.

28. All rolls of balloon fabric shall be plainly tagged with the grade, the manufacturer's name or trade-mark, the date of manufacture and the Bureau of Aircraft Production order number.

#### INSPECTION.

29. All balloon fabric shall be subject to inspection by the Inspection Department of the Bureau of Aircraft Production under its Manual of Inspection.

30. The inspector shall at all times have free access to all parts of the factory which concern the manufacture of balloon fabric ordered to this specification, and shall be afforded every facility to satisfy himself that the fabric is in accordance with this specification.

31. Fabric rejected on account of uneven spreading, pinholes or other imperfections may be used as designated by the Chief of Balloon Inspection.

#### JUDICIAL DECISIONS.

**A. SCHRADER'S SON vs. PROTEx MANUFACTURING Co.**—District Court, Eastern Division of Northern District of Ohio, November 7, 1918.

Suit to prevent the infringement of Twichell patent No. 927,298 for a gage for testing the pressure in automobile tires. Injunction granted. (Federal Reporter, Volume 254, page 438.)

**A. G. SPALDING & BROTHERS, vs. JOHN WANAMAKER, vs. SAMUEL BUCKLEY & Co.** of London and New York.—Circuit Court of Appeals, Second Circuit, February 13, 1919.

The suit was brought for infringement of patent No. 878,254 for a golf ball pitted with circular cavities. The sides of the cavities are very steep, at an angle of 145 degrees at the periphery. The Wanamaker ball had similar circular cavities between sides made at an angle of only 35 degrees with the surface. The court held that these would not accomplish what was claimed for the Spalding ball, that the inclination of the sides was an essential part of the patent and that, therefore, there had been no infringement. Injunction denied. (Federal Reporter, Volume 256, page 530.)

**MILLER RUBBER Co. vs. DeLASKI AND THROPP CIRCULAR WOVEN TIRE Co.**—Circuit Court of Appeals, Sixth Circuit, May 6, 1919.

The DeLaski company brought suit for infringement of their patent, (No. 1,011,450), for a tire-wrapping machine. This patent had been declared valid in the Circuit Court of Appeals for the Third Circuit in the suit of the DeLaski company against W. R. Throop and Sons. Subsequently the DeLaski company acquired the W. R. Throop business.

The Miller company bought a tire-wrapping machine from De Laski and one from W. R. Throop; then it had two more machines built, which DeLaski asserted were made according to his patent; he sued in behalf of the W. R. Throop interests also.

The court held that the question of infringement depended on

whether the pressure head or its equivalent of the DeLaski patent had been used, and decided against the Miller company, declaring that the infringement was "purposeful and inexcusable" and that there was just apprehension that it would be persisted in. (Federal Reporter, Volume 257, page 733.)

#### DECISIONS OF COMMISSIONER OF PATENTS.

**IN RE LINK-BELT COMPANY.**—Court of Appeals of the District of Columbia, June 2, 1919.

Court held that the Commissioner of Patents was right in refusing to register as a trade mark for rubber and fabric belts the word "Service" surmounting a bar with V-shaped ends. The word "Service" in this instance would be descriptive of the goods. "It has a fixed meaning in trade generally as indicating that goods so described are serviceable, and will notably wear well, but are especially adapted to meet the requirements of the user of the goods to which the mark is applied." Decision affirmed. ("Official Gazette," August 26, 1919.)

#### TREASURY DECISIONS.

No. 43314.—Protest 931413 of The Rubber Association of America, Inc. (Seattle).

**GUTTA SIAK.**—Gutta siak, classified at 10 per cent ad valorem under paragraph 385, Tariff Act of 1913, is claimed free of duty under paragraph 502.

Opinion by HAY, G. A. Gutta siak was held entitled to free entry as gutta-percha under paragraph 502. G. A. 8194 (T. D. 37759) followed.

#### INTERESTING LETTERS FROM OUR READERS.

##### AN OPPORTUNITY FOR EUROPEAN TRADE.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

**DEAR SIR:**—I am writing to you with the object of calling your attention to the firm of Ing. Leone R. Talvy, via Vivajo 21, Milan, a member of this chamber, who is desirous of getting in touch with American manufacturers who may be looking forward to extending their business to European countries. Mr. Talvy is favorably quoted here and is in a position not only to cover Italy, but also Serbia, Roumania, Bulgaria, and European Turkey, being acquainted with the markets in said countries, and having branch offices in Belgrade, Serbia.

The articles in which he is more particularly interested are: tubes, sheets, gloves, cushions, ice-bags, etc., and I shall greatly appreciate your kindness, if you will supply Mr. Talvy's address to all such manufacturers whom you may happen to know, who are anxious to secure valuable connections abroad.

This Chamber desires to thank you in advance for the favor and if at any time it can reciprocate the courtesy, it will certainly be glad to do so,

Very truly yours,

Secretary, American Chamber of Commerce of Italy,  
Via Bocchetto 3, Milan, Italy.

#### FOLDING FILTER PAPERS

An improved method for folding filter papers for rapid filtration follows:



FOLDED FILTER  
PAPER.

Instead of tearing off a corner of the filter paper tear a strip back as far as the fold at B, and fold over on to the other side.

This affords a double thickness nearly all around the top of paper, making it less possible for any fine precipitate to crawl over the top of paper, also preventing any air from escaping down along the side of the aper. ("The Chemist-Analyst.")

**THE RUBBER TIRE SUPPLY Co., INC.**, 420 EAST ST. LOUIS street, Springfield, Missouri, has increased its capital stock from \$10,000 to \$20,000.



## Eyelets and Grommets in Rubber Goods.

**A**MONG THE LITTLE THINGS which are used by the million in rubber factories are eyelets and their big brothers, grommets. They are used on various lines of goods, wherever a hole in the material needs strengthening so that strain upon it will not tear through. They sell at \$100 to \$1,500 per million, according to size, kind, quality, and finish.

### MANY DIFFERENT VARIETIES.

There are many varieties. The ordinary eyelet is of brass,



THE STIMPSON EYELET-  
TING MACHINE.

which stamps the disks out of sheet metal and draws each piece into the shape desired.

in one piece, much the shape of a miniature hat without a crown. It consists of a rim and a "barrel," the latter being tubular and of varying length, according to the thickness of material on which it is used. The whole may be of plain brass or may be japanned, or the rim only may be enamelled or covered with a coating of celluloid. The brass eyelet may be finished in silver, tin, copper or nickel. The enamelled and celluloid-covered eyelets are made in a large variety of colors.

While most of these eyelets are circular, there are oval ones and long narrow ones to accommodate wide flat laces. There are also some made with scalloped or corrugated rims for ornamental purposes. These eyelets are made entirely by automatic machinery

### GROMMETS ARE LARGE EYELETS.

Eyelets are made in a great variety of sizes, from the little one only large enough to allow passage of the smallest twine, to those measuring one and one-half inches in diameter. The larger ones are called grommets, though in some trades this name is given to an eyelet of large size which is backed either by a metal washer, or another eyelet just enough smaller in the barrel to fit inside the larger, the two being inserted on opposite sides of the fabric, and pressed firmly together, spreading the ductile barrels, and thus showing rims alike on both sides.

The under side of the common eyelet, when in place, shows the barrel split into six or eight sections which radiate evenly from the center. This effect is accomplished in two ways. If the barrel is scored the "set" of the machine breaks it at the scored lines. If the barrel is not scored, a corrugated "set" is used in the machine, which cuts the barrel into these sections, and curves them, as the pressure is applied.

### RUBBER TRADE LARGE USERS.

In the rubber trade, footwear manufacturers are the largest users of eyelets. Shoes which close by lacing require them—principally hunting and lumbermen's boots, bootees, and other heavy duck lines. Some short rubber boots are made with an oblong "knob pull-on" in place of a pull-strap or loop, and in order that these boots may be hung up when not in use a grommet is placed above the pull-on.

But the large use is in the production of tennis shoes. The common, low-priced "sneakers" made by the million, consume eight to twenty in each shoe. These are of the low-priced

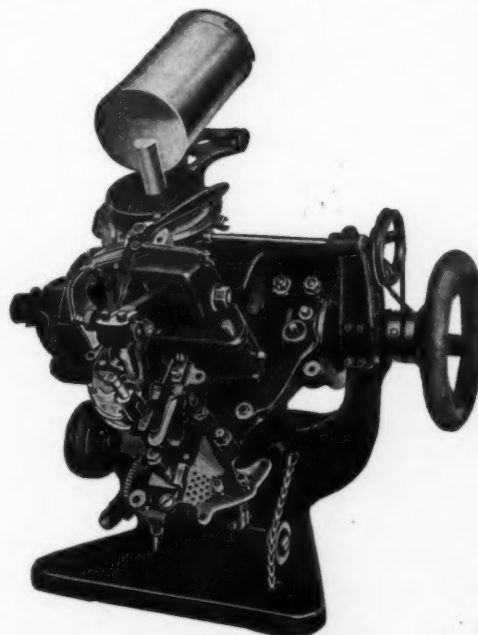
variety. To-day the tennis lines have been improved in style, in quality of material, and in workmanship, and in place of the plain brass eyelets, those of finer quality, enamelled or celluloid-covered, are used, matching in color the fabric in which they are inserted, or finished in contrasting colors.

### LACING STUDS.

Besides eyelets, or in place of them, lacing studs are used in men's and boys' footwear, and to some extent upon puttees and leggings. The lacing hook is an adaptation of the eyelet and is used to facilitate fastening the shoe. It is not used extensively on women's and misses' footwear, mainly because the hooks were found to catch and tear women's skirts, and although present fashions of short skirts obviate this objection, they have not become popular on feminine footwear. The lacing stud is practically an eyelet, with an extension bent over to form a flat, button-like hook which obviates the necessity of inserting the lacing through an eyelet.

### MACHINES FOR SETTING EYELETS.

There are various machines made for "setting" eyelets and studs. The small hand tool, much like a leather-punch, is the simplest. Next, there are adaptations of the same mechanism, by which the eyelet is set by pressure of the foot on a treadle. Then come machines which punch the holes, insert the eyelets, and carry forward the work the proper distance for the next eyelet. These machines are quite complicated. The eyelets or studs are poured into a hopper in which is a revolving brush, which places them right side up in a raceway whence they are



DUPLEX EYELETING MACHINE.

fed to the proper point for insertion. These machines have a capacity limited only by the ability of the operator, some men being able to eyelet 4,000 pairs of shoes per day.

### DUPLEX MACHINES.

There are machines which set two eyelets at once, on opposite sides of the lace space, thus insuring exact matching to

each other. Other machines set in "gangs," inserting at one pressure several eyelets in a row in the lace-stay, and this row may be either straight, or curved to conform to the shape of the lace-stay.

One adaptation of the machine is for producing the "blind eyelet" effect which is in vogue in the best grades of leather



EYELETING TENNIS SHOES.

footwear. The machine punches the holes through the several thicknesses, but sets the eyelets through all except the outside ply, thus giving strength to withstand the strain, yet showing no eyelet when the boot is laced.

Another, and necessarily more complicated machine is used for inserting grommets, or eyelets with washers. For these, two hoppers and their accompanying raceways are required, one for each member of the duplex eyelet, together with mechanism for delivering the opposing members, one above and the other below the fabric or material through which it is to be inserted.

#### EYELETS AND GROMMETS IN RUBBER CLOTHING.

Rubber clothing manufacturers use many eyelets in garments, these being inserted liberally in spaces under the arms to allow ventilation. For a similar purpose, they are also inserted in hats and caps and especially cape-caps and havelocks. There are eyelets or grommets in ponchos, and millions were used in these during the early years of the great war. There is still a demand for ponchos from the Far West, and for export. Rubber blankets are provided with grommets. They are also used in bath curtains. Manufacturers of reducing belts of sheet rubber or rubberized fabrics consume thousands of eyelets. Household aprons are provided with eyelets, as are also aprons used by workmen and workwomen in certain trades. Fountain syringes and hot water bottles have large grommets in the tabs by which they are suspended.

#### GROMMETS IN AUTO TOPS AND CURTAINS.

Grommets are largely used in automobile tops and curtains. Some of these are specially shaped for the purpose of fitting over button fasteners, either plain or turn-buttons. One adaptation is a patented fastener containing springs which grasp the button firmly, which can be unfastened only by pulling in a certain direction, indicated by a dot on the upper member of the eyelet-like fastener. These fasteners are also coming into use on luggage, cases for sporting goods and musical instruments, and other articles of leather and its substitutes. Special tools and machines are made for inserting them.

These are some of the uses for metallic reinforcements of perforations in rubber and rubberized material manufactures.

#### NEW PRICES FOR TENNIS SHOES.

FOLLOWING THEIR CUSTOM of many years' standing, but from which they departed last year, the various rubber manufacturers which include tennis shoes in their list of products sent out new and revised price-lists early in September. As in former years, the United States Rubber Co. took the lead, arranging its mail so that its customers in all parts of the country received the new price-lists simultaneously on the first day of the month. Then soon followed those of the Apsey, Beacon Falls, Converse, Hood and other rubber companies.

As expected, prices for the coming season are higher than those of a year ago, as those were higher than the previous year. Many lines show an advance of 10 per cent, while a goodly number have advanced 15 per cent, and a few, a still higher percentage. However, taken all in all, the trade is to be congratulated that the advance is so moderate, when it is considered that cotton duck and other textiles cost more than double the prices of a year ago, and labor has very materially increased. One material only has declined, crude rubber, but all compounding materials have advanced enough so that it is hardly likely the rubber soles of these shoes can cost any less than a year ago.

The common every-day "sneaker" probably shows as high a percentage of increase in price as any except some of the finest quality shoes. In the larger sizes these show a uniform advance of 15 cents per pair and the smaller 10 cents per pair. Men's Bals which sold in 1917 at 68 cents a pair, net, were marked up to 85 cents in 1918, and are now priced at \$1, while the youth's Oxfords, 60 cents in 1917, were 65 cents last year and 75 cents in the present catalog, while children's Oxfords were respectively 45 cents, 55 cents and 70 cents in the three price-lists.

In the medium quality goods, such as the "Campfire" line of the United States Rubber Co., the "Nantasket" of the Apsey Rubber Co., the "Yale" of the Converse Rubber Co., and the "Lakeside" of the Hood Rubber Co., the prices have advanced 15 or 20 cents; men's Bals from \$1.35 to \$1.50 and men's Oxfords from \$1.20 to \$1.40, while boys' and misses' sizes which were \$1.10 are now \$1.25 and other sizes proportionately.

In the high-priced goods, having rubber heels and soles with narrow foxing, prices show a proportionate advance. Men's Bals which were quoted at \$2.15 last year are now \$2.50, and Oxfords which were \$2 are now \$2.35. The lines in imitation welt have advanced 35 cents per pair, men's Oxfords from \$2.40 to \$2.75 and women's from \$2 to \$2.35.

The companies are vying with each other in producing handsome lines of welt construction, on lasts closely following those used by the up-to-date manufacturers of leather shoes. Each company has its own way of bottoming these shoes in welt construction, lasted by experienced shoemakers, the women's lines with Louis or military heels and the toes following the narrow graceful lines which are now so popular. These boots run as high as \$4 a pair, and pumps at \$3, while men's Bals of similar make and quality are priced at \$3.75 and Oxfords at \$3.25.

Several companies are now producing lines of workmen's shoes, made to take the place of leather shoes for rough wear. The tremendous advance in the latter favors the exploitation of such footwear, which is made with brown or black duck uppers and rubber or fiber soles. As these cost, net, around \$2.25 to \$2.75, while leather upper and leather-soled shoes of similar style and wearing quality range from \$3.50 to \$5 per pair, wholesale, there is no doubt that the already large demand for these workmen's shoes, made in rubber shoe factories, will have a heavily increased sale the coming season.

COPY OF INDEX TO "Rubber Machinery" will be sent free upon request.

## Rubber Tariffs of South America.

EXPORTS of manufactured rubber goods from the United States to South American countries, were \$5,295,962 for 1918, and, while they no longer show the phenomenal annual increases of the last four years, have at least held their own with \$5,522,453, the figures of the record year 1917-1918. The data of comparison have been changed, for the official figures are now for the calendar year, whereas from 1907 to 1918 they were for the fiscal year. The record for this first calendar year, 1918, therefore, includes the figures for the months

Argentina with \$1,429,647 worth is our best customer for automobile tires, with Chile a good second with \$951,102, followed by Brazil \$389,822, Uruguay \$213,290, Peru \$205,887 and Venezuela \$136,881. Chile buys most belting, hose and packing, to the value of \$389,694, Brazil comes next with \$197,360, Argentina third with \$163,077 and Peru fourth with \$82,348. The A B C countries are also the best customers for boots and shoes, druggists' supplies and other manufacturers.

The order in total purchases of rubber goods is: Argentina

### UNITED STATES EXPORTS OF RUBBER GOODS TO SOUTH AMERICA—1906-1918.

EXPORTED TO—	Belting, Hose and Packing. Value.	Boots.		Shoes.		Druggists' Rubber Sundries. Value.	Tires.		All Other Manufactures of Rubber. Value.	Total Values.
		Pairs.	Value.	Pairs.	Value.		Automobile. Value.	All Other. Value.		
SOUTH AMERICA:										
Argentina .....	\$163,077	2	\$8	7,706	\$6,181	\$35,425	\$1,429,647	\$89,519	\$165,544	\$1,889,401
Bolivia .....	43,595	.....	.....	36	21	90	31,678	411	2,381	78,176
Brazil .....	197,360	148	901	20,607	15,339	27,656	389,822	8,115	95,974	735,167
Chile .....	389,694	1,628	7,739	13,521	11,729	25,338	951,102	43,809	142,355	1,572,766
Colombia .....	20,578	12	38	1,443	1,254	1,941	49,630	7,374	17,026	97,841
Ecuador .....	8,292	.....	.....	1,648	1,626	3,005	47,379	592	6,296	67,190
Falkland Islands .....	2,400	.....	.....	.....	.....	.....	.....	.....	.....	2,400
Guiana—										
British .....	2,599	18	57	7,883	5,588	1,792	56,451	1,690	6,165	74,342
Dutch .....	1,327	3	7	192	143	415	3,776	829	1,532	8,029
French .....	41	.....	.....	.....	.....	.....	75	.....	.....	116
Paraguay .....	730	.....	.....	.....	.....	21	264	.....	515	1,530
Peru .....	82,348	189	977	1,073	1,192	4,621	205,887	1,495	26,557	323,077
Uruguay .....	28,036	24	80	2,400	2,004	3,913	213,290	101	19,523	266,947
Venezuela .....	8,411	72	312	544	633	7,592	136,881	2,789	22,362	178,980
†TOTALS, SOUTH AMERICA...	\$948,488	2,096	\$10,119	57,053	\$45,710	\$112,809	\$3,515,882	\$156,724	\$506,230	\$5,295,962
Fiscal year 1917-1918.....	\$969,669	2,767	\$13,712	72,785	\$53,677	\$136,611	\$3,432,181	\$330,506	\$586,097	\$5,522,453
Fiscal year 1916-1917.....	678,441	5,611	21,785	84,154	50,723	.....	2,596,936	222,563	893,235	4,463,683
Fiscal year 1915-1916.....	402,732	6,258	16,333	75,838	40,461	.....	1,050,398	293,916	616,891	2,420,731
Fiscal year 1914-1915.....	205,223	2,154	7,800	56,045	29,750	.....	214,068	50,397	230,138	795,575
Fiscal year 1913-1914.....	226,122	2,908	10,306	65,781	37,251	.....	115,387	61,943	184,462	635,471
Fiscal year 1912-1913.....	216,390	3,952	15,993	170,471	100,196	.....	100,065	101,440	231,625	765,709
Fiscal year 1911-1912.....	187,643	*116,911	*81,540	.....	.....	.....	46,618	49,820	235,013	600,634
Fiscal year 1910-1911.....	148,715	*114,494	*81,792	.....	.....	.....	18,768	44,632	209,608	502,915
Fiscal year 1909-1910.....	150,579	*75,135	*47,761	.....	.....	.....	.....	.....	212,175	410,515
Fiscal year 1908-1909.....	93,869	*106,543	*59,146	.....	.....	.....	.....	.....	136,959	289,974
Fiscal year 1907-1908.....	104,974	*81,287	*48,380	.....	.....	.....	.....	.....	117,949	271,303

† Calendar year 1918.

\* Including shoes.

from January to June, which are also used in the record for the fiscal year 1917-18, of which these months constitute the second half.

The exports, which had been steadily increasing for ten years and had about trebled in that time, took a great jump in 1914-15, the second year of the war, rising from nearly \$800,000 to over \$2,400,000; the following year added \$2,000,000 more and the year after another million. The increase exports were almost wholly of tires and of belting, hose and packing. The former, amounting to \$62,800 in 1910-11 had risen to \$264,465, in 1914-15; this became \$1,344,314 in 1915-16, \$2,819,499 in 1916-17, \$3,762,687 in 1917-18, and stands at \$3,672,606 in the calendar year, January to December, 1918.

So with belting, hose and packing which stood at a little less than the annual average in 1914-15 with \$205,223; it rose to \$402,753 in 1915-16, nearly double, to \$678,441 in 1916-17, to \$969,669 in 1917-18, again doubling the exports of two years before, and remains at \$942,488 in the calendar year 1918.

Exports of boots and shoes were irregular with a strong tendency to decline; the number of pairs, 59,149, is, with one exception, the smallest exported in a dozen years, while the value \$55,829 is also below the average. Druggists' sundries appear for the first time in the list with \$136,611 for the fiscal year 1917-18 and \$112,809 for the calendar year 1918. In both years they should be added for the purposes of comparison to "other manufacturers of rubber" with which they were classified before. This will diminish the great apparent falling off in that class, by making the total for "other manufactures" \$722,708 in 1917-18 and \$619,089 in 1918.

Looking at the individual countries it will be noticed that

\$1,889,401, Chile \$1,572,766, Brazil \$735,167, Peru \$323,077, Uruguay \$266,947, Venezuela \$178,980, Colombia \$97,841; French Guiana with \$116 tails the list.

The succeeding extracts from the tariffs of the principal countries of South America are intended to show the competition to which the United States rubber manufacturers are subject under existing tariff conditions. Owing to frequent tariff changes, the figures and information given below should be periodically verified, and small trial shipments made to test the rates.

#### ARGENTINA.

Equivalents.—Peso (gold), 96.8 cents; kilo, 2.2 pounds; g. w., gross weight.

#### CRUDE RUBBER, ETC.

Tariff No.		Duty per Kilo, in Pesos.
16.	Caoutchouc in the natural state.....	0.05
18.	Caoutchouc purified ( <i>goma elastica</i> ).....	0.324

#### PASTES, ETC.

18.	Liquid rubber, in any receptacle (g. w.).....	0.135
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#### TIRES.

18.	Tires for automobiles.....	0.54
18.	Tires for carriage and cart wheels.....	0.405

#### BOOTS AND SHOES.

18.	Boots and shoes of cloth, with caoutchouc soles:	
	For infants .....	2.10
	For children .....	2.52
	For men and women .....	5.04
	Of caoutchouc ( <i>caucho</i> ), including weight of receptacle....	0.525
	Of cloth and rubber, with sole of rubber:	
	Up to 25 centimeters.....	1.26
	Of greater size.....	2.94
	Of rubber and felt:	
	For children .....	1.26
	For infants .....	0.63
	For women .....	1.68
	For men .....	2.10



	Duty Per Kilo, in Pesos.	Valuation Bolivianos.	Per- centage Payable.
Soles and wads of rubber for boots, with or without insertion of cloth.....per kilo	0.42		
<b>DRUGGISTS' SUNDRIES.</b>			
18. Vulcanized rubber (English sheet, etc., black or red), bags, bands, cloth, bandages, teats, trusses, pumps, sponges, tube—less than 5 mm. in diameter.....each	1.35		
Urthral sounds or catheters.....each	0.027		
Tubes of from 5 mm. in diameter, rings for teething, syringes, etc.....each	0.81		
Lined or woven with cotton, linen or wool, forming bands, measures, teats, and other articles for medical uses.....	1.35		
The same, lined, or woven with silk or mixture thereof.....	2.94		
Hard rubber in the use of canulas, syringes, and for other medical purposes.....	0.945		
18. Druggists' supplies of gutta percha cloth, and gutta percha for dentists.....	0.675		
Druggists' supplies manufactured of gutta percha.....	1.35		
All other articles for medical uses.....m. & s.			
<b>OTHER GOODS.</b>			
16. Rubber, in bands, for billiards.....	0.405		
Elastic, worked into sheets, valves, belting, cords, and mats.....	0.162		
The same, with cloth and metal insertions.....	0.405		
Rubber in the form of horseshoes, rings, bands for saws, etc.....	0.0945		
Flexible tubes of rubber and asphalt, for electrical purposes.....	0.78		
Cases for guns, made of rubbered cloth.....each	2.52		
Capes of waterproof or rubber cloth, with or without hood, for men or women, and overcoats and ponchos of the same cloth.....	0.54		
Collars of rubber.....dozen	0.63		
Leggings of rubber or waterproofed cloth.....pair	0.675		
Cuffs of rubber.....dozen pairs	1.89		
Elastic cords for physical exercises.....dozen			
Match boxes of rubber.....dozen	0.27		
Common quality.....dozen	0.81		
Medium or fine quality.....dozen	0.405		
Erasing rubber, and rubber for cleaning razors.....	0.675		
Rubber in cord, and rubber for hose or slings, and rubbers and tubes for vaporizers.....	0.324		
Toys of vulcanized or elastic rubber.....dozen	2.70		
Rubber stamps, complete or not.....dozen	0.27		
Tobacco pouches of rubber.....dozen	1.35		
Braids or elastic cords with silk.....	0.81		
The same, of cotton.....	0.81		
Boot elastics with silk.....	0.54		
Boot elastics, other.....	0.27		
Tubes, pipes, hose, angles and joints, of rubber, with insertion of cloth, excepting those of English sheet or its imitations.....	0.162		
The same, with insertions of cloth, and with or without wire.....	0.54		
18. Rubber balloons, with mouthpiece of wood or bone.....	1.62		
Without mouthpiece.....	0.54		
18. Rubber cloth, such as mackintosh, silk, etc.....	1.35		
7. Silk fabrics combined with rubber, known as waterproof.....	0.27		
5. Rubberized cotton cloth, for hats.....	0.216		
9. Waterproof, rubbered cotton tissues.....			
2. Waterproof cotton tissues mixed with rubber and wool.....	0.135		
5. Elastic garters of cotton.....dos. pairs	0.405		
3. Belts of cotton with or without elastic.....dozen	0.54		
5. Cotton suspenders, with or without elastic.....dozen			
12. Wire or cables of copper covered with cotton, gutta percha or other materials, except lead or silk, and except all kinds of flexible cord.....	0.189		
Of wire up to 5 mm. in diameter.....	0.03		
Of wire more than 5 mm. in diameter.....			
<b>BOLIVIA.</b>			
<i>Equivalents.</i> —Boliviano, 0.40 cents; kilo, 2.2 pounds; g. w., gross weight.			
Tariff No.	CRUDE RUBBER, ETC.	Valuation. Bolivianos.	Per- centage Payable.
1596.	India rubber, unwrought (g. w.).....kilo	4.00	30
1638.	Gutta percha, unwrought (g. w.).....kilo	4.00	30
<b>PASTES, ETC.</b>			
840.	Liquid rubber cement, including packing.....kilo	1.60	30
<b>BELTING, HOSE AND PACKING.</b>			
985.	All kinds of machinery, belting.....kilo	3.00	Free
1986.	Hose of rubber, with or without cloth or common metal (g. w.).....kilo	1.50	25
1989.	Rubber tubes for irrigators, nasal douches, syringes, etc., including packing.....kilo	12.00	30
1204.	Steam packing, for machines (g. w.).....kilo	0.50	Free
<b>BOOTS AND SHOES.</b>			
579.	Rubber top boots for men.....dozen pairs	36.00	45
595.	Rubber shoes, with or without waterproof lining, including packing.....kilo	3.20	40
596.	With woolen or other covering, lined or unlined, including packing.....kilo	5.00	40
597.	Roller skates and shoes with rubber soles, for games (including packing).....kilo	6.00	40
598.	Bath shoes, with metal or rubber soles.....dos. pairs	12.00	40
2401.	Gutta percha heels, for boots and shoes, including packing.....kilo	6.00	30
<b>DRUGGISTS' SUNDRIES.</b>			
1590.	Dental rubber and gutta percha, including packing.....kilo	10.00	30
2647.	Suspensory bandages, linen or cotton, with or without rubber, including packing.....kilo	5.00	30
2641.	Probes and catheters, including packing.....kilo	8.00	15
1507.	Syringes of rubber.....kilo	7.00	30
1508.	Of hard rubber or gutta percha.....kilo	6.00	30
2335.	Nipples of rubber, including packing.....kilo	8.00	30
163.	Teething rings, including packing.....kilo	5.00	30
1587.	India rubber tubes, sheets or the like, combined or not with tissue or common metal (g. w.).....kilo	2.00	30
1639.	Gutta percha sheets (g. w.).....kilo	6.00	30
1489.	Rubbered cotton fabrics.....kilo	4.00	30
846.	Braids and cords, interwoven with rubber, including packing.....kilo	6.50	30
855b.	Woolen braids and cords, interwoven with rubber, including packing.....kilo	7.50	30
865.	Fabric of silk and rubber.....kilo	20.00	35
871.	Belts, cotton, with rubber.....kilo	5.00	40
2444.	Waterproof coats of all kinds (g. w.).....kilo	8.00	40
2600.	Dress shields, including packing.....kilo	6.00	30
2602.	Dress shields of rubber with silk fabric (g. w.).....kilo	14.00	30
2584.	Rubber stamps, for ink, with or without pad.....dos.	20.00	30
2585.	Stamps for dating.....dos.	30.00	30
2587.	Stamps for sealing, with wood or bone handle.....dos.	12.00	25
2588.	Same with ivory or mother of pearl handle.....dos.	60.00	25
2589.	Stamps for dating, finished or unfinished.....dos.	48.00	25
2590.	Automatic dating and numbering stamps.....each	25.00	25
1588.	Erascra, including packing.....kilo	3.50	30
1589.	Erascra, with wooden or common metal sheath, including packing.....kilo	7.00	30
1830.	Toys, with or without pieces of other material, including packing.....kilo	4.00	30
1085.	Collars and cuffs.....kilo	8.00	30
739.	Rubber pads, for writing desks, including packing.....kilo	2.50	30

According to the law of December 1, 1911, duty-free and exempted goods shall be subject to 2 per cent of their tariff valuation.

Duty-free goods which are cleared "according to appraisement" shall be deemed liable to 30 per cent *ad valorem* in accordance with Article 1 of the Act dated December 31, 1905, and the net tax referred to in this article shall be reckoned on said 30 per cent.

The following alone shall be exempted from duty: goods introduced for the different departments of the State, subject to the previous authority of the Ministry of Finance; goods intended for the personal use of members of foreign legations; goods imported by railway concerns under existing contracts; material destined for the undertaking named *Luz y Fuerza Cochabamba*, goods which may be expressly free under international treaties; plant for the match factory; articles for hospitals and benevolent asylums, also materials for public works imported by the municipalities; accessories imported by educational establishments.

By an ordinance of May 2, 1913, a tax of 8 per cent is levied on fine Pará or Mollendo exported through the custom houses of La Paz, Oruro, Yacuíba, Puerto Suarez, San Matías, Cobija and Abuna, as well as on bernamby. Fine Pará, the lower grades of rubber and bernamby passing through the custom houses of Villa-Bella and Guayamerin are dutiable at the rate of 10 per cent.

As the valuation of this rubber depends on the fluctuations of prices in London, the tax is not levied in a uniform manner. From time to time London prices are taken for fixing official valuation upon which the percentage is calculated, after expenses of production have been deducted.

The preceding regulations refer to footwear exceeding 20 cm. sole. From 15 to 20 cm. sole is appraised with a rebate of 50 per cent; up to 15 cm. inclusive, with a rebate of 75 per cent.

#### BRAZIL.

*Equivalents.*—Milreis (1,000 Reis, gold) 54.6 cents; paper, 32.4 cents; kilo, 2.2 pounds.

#### BELTING, HOSE AND PACKING.

Tariff No.	Duty Per Kilo, in Reis.	Ad Valorem Duties. Per Cent.	Tare Allow- ance. Per Cent.
955.	Machine belting of cotton and rubber.	1.800	30
1053.	Hose, threads, leaves or sheets.....	1.200	50
1033.	Machine packing.....	1.000	50

#### BOOTS AND SHOES.

1633.	Footwear.....	3.000	50
810.	Pneumatic tires and inner tubes, made of Brazilian rubber, fine Pará.....		5
	The same, of other rubber.....		50
1033.	Solid tires, made of Brazilian rubber, fine Pará.....	100	50
	The same, of other rubber.....	10.000	50

#### DRUGGISTS' SUNDRIES.

903.	Nipples, complete, with capsule and tube.....dozen	1.000	15
	Nipples alone.....dozen	200	15
907.	Elastic stockings of linen or cotton, Of silk.....dozen	6,000	15
	Syringes and irrigators of hard rubber.....dozen	16,000	14
215.	Speculums of hard rubber.....dozen	3,200	15
927.	Cupping-glasses of rubber and glass,.....dozen	3,200	15
928.	Other surgical goods of rubber.....dozen	2,000	15
		10,000	15

#### OTHER GOODS.

617.	Tissues, rubbers, packings and washers of asbestos fabric combined or not with wire or a composition of rubber or talc.....	1.100	20
	Paper and cardboard in sheets or cut in any shop for whatever use, combined or not with rubber, wire, or in pulp admixture of another material.....	500	20
668.	Wire, in cords, strings, cables, cordage and other wares: Covered with paper, cotton, rubber, or other composition.....	900	30
	Covered with cotton and rubber, armored, for submarine or underground cables, for electric installations, etc.....		20

Hogsheads or cases 5

Hogsheads or cases 5

Hogsheads 10 Cases 20

Hogsheads 10 Cases 20

Tariff No.		Duty Per Kilo, in Reis.	Ad Valorem Duties, Per Cent.	Tare Allowance, Per Cent.
795.	Office erasers with handles of bone, wood, horn or common metal. <i>dozen</i>	2,400	50	(*)
	Manufactures of rubber, celluloid, and gutta percha, vulcanized or not:			
1033.	Pots and other articles for domestic use, funnels, capsules and bottles.	2,600	50	(*)
	Sticks, whips and similar articles.	5,000	50	(*)
	Tobacco pouches, tips of walking sticks and match box covers.	4,000	50	(*)
	Dolls, toys and similar articles.	3,500	50	(*)
	Buttons of all kinds.	4,000	50	(*)
	Combs, rulers and penholders.	4,000	50	(*)
	Belts, braces, garters, cords, ribbons and braids, covered with pure or mixed silk.	30,000	50	(*)
	The same, covered with any other material.	7,000	50	(*)
	Preparation or composition for dentists.	3,200	50	(*)
	Jewelry.	10,000	50	(*)
	Stems and tubes for flowers.	7,000	50	(*)
	Rubber combined with cotton, wool or linen:			
	In the piece or in cuttings.	4,000	50	(*)
	In articles not specially mentioned.	7,000	50	(*)
	Rubber combined with pure or mixed silk fabrics:			
	In the piece or in cuttings.	7,000	50	(*)
	In articles not specially mentioned.	15,000	50	(*)
	Door mats.	1,300	50	(*)
	Coverings for floors, stairs, etc.:			
	Made of fine Pará.	100	50	(*)
	Made of other rubber.	10,000	50	(*)
	Articles not specially mentioned.		50	(*)

Machine belting, rubber or asbestos laces, and flax, cotton or hemp cords for transmission apparatus used for the improved manufacture of sugar and for the erection or improvement of central stations, when directly imported by agriculturists or enterprises are affected by article 424 of the Consolidated Customs Law.

The following articles, when imported by agriculturists, agricultural syndicates, navigation and railway companies, or by undertakings and works engaged in the manufacture of faience ware, fine stoneware and chinaware, or of glazed flooring tiles, in the manner, and with the restrictions provided for in Decree No. 8592, of March 8, 1911, shall pay duties set forth below:

	Reis Per Kilo.
617. Tissues, ribbons, machine packing and washers of tissue, combined or not with wire or with a composition of rubber or talc.	150
Combined or not with rubber with or without wire, and in pulp with an admixture of another material.	100
995. Machine belting of cotton, linen, wool or rubber.	200
1033. Machine packing.	160

Decree No. 9323, of January 27, 1912, provides a rebate of 20 per cent on rubber manufactures, mentioned in tariff No. 1033, imported from the United States.

All manufactures duly certified to be made of fine Pará rubber are to pay 5 per cent of the ordinary tariff rates of duty (or 10 per cent in the case of electric cables insulated with rubber). Tires not made of fine Pará are to pay 15 per cent ad valorem except tires destined for motor lorries, which are to continue paying 5 per cent ad valorem.

Surgical instruments and apparatus, and apparatus required for medical treatment and with disinfectants, are entitled to a rebate of 90 per cent of the tariff rates, if such goods are destined for charitable and public free relief establishments.

Customs duties payable in gold, hitherto calculated on the value of goods at the rate of exchange of 12 pence (24 cents) per 1,000 reis, are at present assessed at the rate of exchange of 16-5/16 pence (32½ cents).

\*Articles packed in cases or boxes of cardboard are rated on their gross weight.

## COLOMBIA.

Equivalents—Gold dollar, 96 cents; kilo, 2.2 pounds.

## CRUDE RUBBER, ETC.

Tariff No.	Duty Per Kilo in Dollars.
390. Crude rubber, purified or not.	\$0.30
354. Unmanufactured gutta percha.	0.30

## PASTES, ETC.

406. Rubber solution	0.25
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## BELTING HOSE AND PACKING.

392. Driving straps or belts.	0.01
400. Hose pipes.	0.01
381. Rings, washers, joints, collars, stops or stop pieces, and other accessories for machines, motor vehicles and bicycles, and the unmanufactured material for manufacturing these articles.	0.20
389. Footwear of rubber ( <i>zapatos</i> ).	1.00

## BOOTS AND SHOES.

1581. Cotton footwear with soles of rubber, leather, etc.	1.50
1615. Linen footwear with soles of rubber, leather, etc.	1.70
407. Rubber soles and heels.	0.35
402. Elastic sides for footwear.	0.50

## TIRES.

Tariff No.		Duty Per Kilo in Dollars.
399.	Tires either cut or in sections for cutting.	0.02
851.	Solid or pneumatic tires for all kinds of vehicles.	0.02

## DRUGGISTS' SUNDRIES.

587.	Sponges of rubber, lined or not.	1.00
691.	Babies' rings or comforters of any kind.	0.10
710.	Canulas of rubber, bone or glass, for syringes.	0.25
711.	Rubber capsules for bottles.	0.25
713.	Rubber tissue for surgical uses or for invalids, in the form of ice and hot water receptacles, abdominal belts, feeding bottles, rupture trusses, urinals, balls or pumps, in tubes less than 8 centimeters in diameter, nasal tubes, and in general, rubber tissue in any form for medical use.	0.25
719.	Teething rings of any kind.	0.25
720.	Small glass or rubber vessels, and respiratory apparatus.	0.25
726.	Suckers and feeding bottles.	0.25
736.	Abdominal belts of any kind, not specially mentioned.	0.25
743.	Rubber gloves, for surgical or industrial purpose.	0.25
747.	Rubber sprinklers.	0.25
755.	Elastic stockings and bands.	0.25
765.	Nipple shields of glass with or without pump and tube of rubber.	0.10
771.	Compression, rubber pump or embolus atomizers.	0.25
773.	Orceat pumps of any kind.	0.25
778.	Rubber stoppers for receptacles.	0.10
784.	Rubber tubes for sprinklers.	0.25

## OTHER GOODS.

380.	Rubber floor cloth and mats.	0.35
382.	Rings for fastening parcels.	0.20
391.	Vulcanized rubber for mounting artificial teeth.	1.30
393.	Knives, forks, utensils and instruments with handles of rubber, celluloid or gutta percha.	0.60
395.	Rubber cord for catapults or slings.	5.00
397.	Toys, not covered or dressed.	0.60
398.	Toys, covered or dressed.	1.50
401.	Combs and braid combs.	1.00
403.	Articles of clothing made from unmanufactured rubber cloth.	1.00
404.	Life belts.	0.10
405.	Stamps.	1.50
406.	Plugs and stoppers.	0.10
409.	Rubber carpets and cloth for flooring.	0.50
412.	Tiles and cloth for roofing and for boats.	0.01
412.	Thick rubber cotton cloth, suitable for riding trousers.	0.90
413.	Thin rubbered cotton cloth, suitable for traveling coats and articles of clothing.	1.10
414.	Rubbered woolen cloth.	1.50
415.	Unmanufactured cloth, for surgical and dental purposes.	0.35
416.	Tubes and pipes.	0.05
749.	Insulators of rubber, and other materials, not specified.	0.03
779.	Metal wires, not specified, and metal cables protected with gutta percha, tar, etc.	0.01
802.	Rubber bands for insulators and other material used for insulating, not specially mentioned.	0.02
937.	Disinfecting and fire-extinguishing apparatus and accessories, such as hose pipes of rubber, canvas, etc., imported with such apparatus.	Free
951.	Suspension baths, with body of iron or tinplate, rubber tube, brush and dish of rubbered tissue.	0.20
1241.	Erasers.	0.15
1242.	Hand stamps.	0.17
1465.	Traveling cloaks or ponchos of rubberized cotton.	1.00
1546.	Wool and elastic waist-bands, with clasps.	1.60
1573.	Wool and elastic garters, with clasps.	1.60
1591.	Traveling cloaks or ponchos of rubbered wool.	1.60
1592.	Overcoats and clothing of rubbered wool.	1.80
1598.	Rubbered woolen fabric, not specified.	1.50
1600.	Suspenders of wool and elastic, with clasps.	1.60
1601.	Strips or bands of wool, for belts, garters or suspenders, rubbered or not.	1.50
1678.	Linen and elastic material for footwear.	0.55
1689.	Clothing of rubbered linen.	1.20
1691.	Traveling cloaks and ponchos of rubbered linen.	1.20
1707.	Rubbered linen fabric, not specified.	1.10
1757.	Rubbered silk fabric, not specified.	2.00
1763.	Silk and elastic suspenders, including clasps.	3.00
1764.	Elastic silk strips for belts, garters or suspenders.	2.50
1765.	Clothing of rubbered silk.	2.50
383.	Manufactured articles of rubber or gutta percha, not specified.	1.00

\*Cloths for flooring and boats will not be considered as such when weighing less than two kilos per superficial square meter.

## CHILE.

Equivalents—Gold peso, 36 cents (about); kilo, 2.2 pounds; g. w., gross weight; l. w., legal weight.

## CRUDE RUBBER, ETC.

Tariff No.		Duty Per Kilo in Pesos.
179.	Crude rubber, gutta percha or balata (g. w.).....	0.04
183.	Rubber waste (g. w.).....	0.12

## PASTES, ETC.

184.	Rubber solution (l. w.).	0.60
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## BELTING, HOSE, AND PACKING.

1501.	All kinds of machinery belting (l. w.).	0.25
528.	Asbestos and rubber packing (g. w.).	0.35
209.	Tubcs or hose-piping of rubber (g. w.).	0.40

## BOOTS AND SHOES.

225.	Boots and shoes and all classes of footwear of rubber, with or without pieces of other material, including also those which have only rubber soles (kilo net).	2.00
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## DRUGGISTS' SUNDRIES.

Tariff No.	Description	Duty per Kilo in Pesos.	Tariff No.	Description	Valuation. Pesos.	Duties. Per Cent.
1232.	Abdominal bands, bandages or belts (l. w.)—		1086.	Rubber belts, plates, valves.....	kilo 1.20	35
1233.	Of cotton and rubber.....	4.00	1087.	Rubber belts, plates, valves, with insertions of cloth or metal.....	kilo 0.80	35
1234.	Of wool and rubber.....	6.00	889.	Pipes, tubes, hose, elbows or joints of rubber, or English sheet.....	kilo 1.00	35
1273.	Refined gutta percha (l. w.).....	25.00	990.	The same with insertions of cloth, with or without wire.....	kilo 0.60	35
1276.	Drop-counters of rubber and glass (l. w.).....	4.50	891.	The same of rubber, in strips special for the manufacture of match boxes.....	kilo 1.50	35
1301.	Nursing bottles with rubber parts (l. w.).....	1.50	1025.	Packings of all kinds not enumerated.....	kilo 0.45	35
1306.	Elastic stockings and similar articles (l. w.)—					
	Of silk.....	16.00				
	Other kinds.....	6.00				
1320.	Nipples and nipple shields with rubber parts (l. w.).....	1.20				
1227.	Other surgical goods:					
	Of rubber or rubbered fabric (l. w.).....	2.50				
	Of hard or vulcanized rubber (l. w.).....	1.50				
	<b>OTHER GOODS.</b>					
180.	Rubber sheets (g. w.).....	0.20				
181.	Rubber combined with cloth or metal (g. w.).....	0.36				
182.	Rubber, vulcanized, in sheets (g. w.).....	1.20				
185.	Plugs, stoppers and rings for use in packing preserves (l. w.).....	0.60				
	Elastic of rubber and cotton (l. w.)—					
150.	More than 12 centimeters wide.....	0.60				
757.	Up to 12 centimeters wide.....	1.80				
772.	Garters, braces, suspenders of cotton and rubber (l. w.).....	3.50				
811.	Clothing of rubbered cotton (kilo net).....	6.00				
	Elastic of rubber and linen (l. w.)—					
848.	More than 12 centimeters wide.....	0.60				
849.	Up to 12 centimeters wide.....	1.80				
859.	Lines and rubber garters, braces, suspenders (l. w.).....	4.00				
874.	Dress shields of rubbered linen (l. w.).....	2.40				
901.	Rubbered woolen cloth (kilo net).....	0.50				
	Elastic of rubber and wool (l. w.)—					
935.	More than 12 centimeters wide.....	0.60				
936.	Up to 12 centimeters wide.....	3.00				
945.	Wool and rubber garters, braces, suspenders (l. w.).....	4.00				
956.	Dress shields of rubbered wool (l. w.).....	2.40				
965.	Clothing of rubbered wool (kilo net).....	7.00				
977.	Rubbered silk waterproof cloth (kilo net).....	1.50				
	Elastic of rubber and silk (l. w.)—					
1011.	More than 12 centimeters wide.....	1.00				
1012.	Up to 12 centimeters wide.....	8.00				
1021.	Garters, braces, suspenders of silk and rubber (l. w.).....	14.00				
1045.	Dress shields of rubbered silk (l. w.).....	6.00				
1058.	Waterproof clothing of rubbered silk (kilo net).....	12.00				
1720.	Rubber-insulated wire (g. w.).....	0.10				
1764.	Rubber toys (l. w.).....	2.50				
1779.	Balls for tennis, football, etc. (l. w.).....	3.00				
200.	Rubber goods, not specified (l. w.).....	0.75				

The importation of plants, seeds, roots, etc., is permitted only after a certificate, attesting to the freedom of the goods from disease, has been issued by the office charged with the sanitary inspection of vegetable products.

By net weight is understood the weight of the goods deprived of all coverings, or the weight of the goods which are without packings and are cleared merely fastened together.

By legal weight is understood the weight of goods with all their receptacles (including fastenings), with which they are packed inside external wrapping serving as a general receptacle, but excluding straw, chips, paper, sawdust and other materials used for the disposal of packets.

By gross weight is understood the weight of the goods with all their packings and wrappings, inside and outside.

## ECUADOR.

Equivalents—Lucra, 44 cents; kilo, 2.2 pounds; g. w., gross weight; n. w., net weight.

Class No.	Description	Duty Per Kilo in Lucra.
2.	Rubber belting.....	Free
7.	Rubbered (g. w.).....	0.04½
12.	Waterproof tents and covers (g. w.).....	0.11½
12.	Wire ropes and cables (g. w.).....	0.11½
17.	Worked india rubber, for floor covering, prepared and painted (g. w.).....	0.22½
21.	Hose (g. w.).....	0.34
25.	Rubber tires (n. w.).....	0.45
27.	Waterproof cloth (g. w.).....	0.56½
28.	Engine packings (n. w.).....	0.57
32.	Manufactures of rubber not elsewhere specified (n. w.).....	0.68
32.	Garters, other silk (n. w.).....	0.68
32.	India rubber tubes (n. w.).....	0.68
33.	Erasers (n. w.).....	0.90
33.	Stamp rubber (n. w.).....	0.90
37.	Waterproof cloaks and other waterproof clothing (n. w.).....	1.13
38.	Rubber sponges (n. w.).....	1.36
38.	Rubber boots, leggings and shoes (n. w.).....	1.36
38.	Rubber balls for carnival (n. w.).....	1.36
38.	Rubber gloves (n. w.).....	1.36
38.	Rubber or metal stamps and apparatus and cases for keeping and inking them (n. w.).....	1.36
47.	Elastic bands of imitation silk vegetable fiber (n. w.).....	3.39
49.	Billiard balls of composition, gutta percha or celluloid (n. w.).....	4.51
52.	Silk garters and braces (n. w.).....	7.90
55.	Rubber preservatives (n. w.).....	11.28

## PARAGUAY.

Equivalents—Peso, 96 cents; kilo, 2.2 pounds; g. w., gross weight; n. w., net weight.

## CRUDE RUBBER, ETC.

2063.	Rubber, in the natural state.....	kilo 1.00	35
2064.	Refined or elastic gum.....	kilo 1.50	35

## FASTES.

1157.	Rubber liquid, in any receptacle.....	kilo 0.50	35
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## BELTING, HOSE AND PACKING.

275.	Belting of hemp, cotton or other fiber, combined or not with rubber or gutta percha.....	kilo 0.60	35
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## BOOTS AND SHOES.\*

375.	Boots and shoes (all sizes) of felt called de crema with elastic.....	dozen pairs 6.00	55
378.	Boots and shoes of cloth, with sales of rubber or other materials, for infants.....	dozen pairs 5.00	55
379.	The same, for children.....	dozen pairs 6.00	55
380.	The same, for men and women.....	dozen pairs 12.00	55
382.	Boots and shoes of rubber, including top boots, weighed together with the packing.....	kilo 1.25	55
383.	Of cloth and rubber, with soles of rubber, up to 25 centimeters long.....	dozen pairs 3.00	55
384.	The same, larger sizes.....	dozen pairs 7.00	55
396.	Soles and heels of rubber, with or without insertions of fabric.....	kilo 1.00	35
405.	Elastics for footwear, with silk.....	kilo 3.50	40
410.	Elastics for footwear, without silk.....	kilo 2.00	35

## TIRES.

1083.	Rubber in the shape of tires for carriage or cart wheels.....	kilo 1.50	35
1089.	Tire for automobiles.....	kilo 2.00	35

## DRUGGISTS' SUNDRIES.\*

2085.	Vulcanized rubber (English sheet and the like, black or red), bags, belts, cloth, bands, nursing nipples, tires—single or double pairs for pulverizers, sponges, tubes of less than 5 millimeters in diameter and any other article for medical purposes, not elsewhere specified.....	kilo 5.00	35
2386.	Probes, urethral.....	each 0.10	35
2087.	Tubes of 5 millimeters in diameter and over, stoppers, teething rings, syringes, etc.....	kilo 3.00	35
2088.	Elastic belts, stockings, bandages and similar articles for medicinal use.....	kilo 5.00	35
2389.	The same, of pure or mixed silk and rubber.....	kilo 7.00	40
2090.	Rubber on tissue, such as mackintosh, silk, etc.....	kilo 2.00	35
2091.	Ebonite, and the like, canulas, syringes, pessaries, or any other article for medical use.....	kilo 3.50	35
2753.	Elastic belts or bands.....	each 1.50	35
2809.	Nipple shields with rubber pump.....	each 0.30	35
2833.	Pulverizers, vapor, with or without rubber bulb.....	dozen 8.00	35
2835.	Breast pumps, with rubber pumps, mounted or not, each.....	each 0.40	35
2836.	The same, with rubber tube.....	each 0.20	35
2868.	Cupping glasses with rubber pump.....	each 0.30	35

## DRUGGISTS' SUNDRIES.\*

1085.	Rubber billiard cushion.....	kilo 1.50	35
1086.	Corus and foot wipers.....	kilo 1.20	35
1087.	The same, with insertions of metal or cloth.....	kilo 0.80	35
1088.	In the shape of horseshoes, rings, bands for cutting up, etc.....	kilo 1.50	35
1539.	Wire or cables of copper up to 5 millimeters in diameter, covered with cotton, gutta percha or other material except lead, silk or any kind of flexible corus.....	kilo 0.70	35
1540.	The same, over 5 millimeters in diameter.....	kilo 0.60	35
1541.	The same, up to 5 millimeters in diameter, coated with lead.....	kilo 0.50	35
1542.	The same, over 5 millimeters.....	kilo 0.50	35
1543.	The same, any diameter, covered with silk.....	kilo 2.50	40
1546.	Wire or cables of iron or steel covered with cotton, gutta percha or other material.....	kilo 0.30	35
1570.	Insulating tapes of rubber.....	kilo 1.60	35
1576.	Ebonite in plates, tubes or rods.....	kilo 1.20	35
2945.	Dress preservers of rubber or waterproof cloth, without silk.....	kilo 3.00	35
2946.	The same, with silk.....	kilo 3.50	40
3153.	Balloons of rubber, with mouthpiece of wood or bone.....	kilo 2.00	35
3154.	The same without mouthpiece.....	kilo 6.00	35
3155.	Erasers and razor wipers of rubber, also elastic bands for match boxes.....	kilo 1.50	35
3156.	Rubber cord and elastic bands for papers, sleeves, slings; rubber accessories and tubes for vaporizers.....	kilo 2.50	35
3207.	Toys of vulcanized rubber or elastic gum.....	kilo 1.50	35
3229.	Garters, elastic; of cotton.....	dozen pairs 0.50	35
3231.	Of pure or mixed silk.....	dozen pairs 2.00	40
3232.	The same, fine, including garters in pairs, put up in boxes.....	dozen pairs 4.00	40
3267.	Wares of vulcanized rubber or elastic gum, not specified.....	kilo 1.50	35
3353.	Fountain pens or other material.....	dozen 5.00	35
3393.	Tobacco pouches of rubber or leather, all kinds.....	dozen 1.50	35
3433.	Galloons of silk elastic.....	kilo 5.00	40
3436.	Galloons of cotton elastic.....	kilo 3.00	35
3769.	Cotton fabric, with rubber, waterproof.....	kilo 0.80	35
3710.	The same, combined with wool and rubber.....	kilo 2.00	35
3739.	Woolen fabrics with rubber.....	kilo 3.00	35
3740.	Woolen fabrics combined with cotton and rubber.....	kilo 2.50	35
3740.	Silk fabrics with rubber.....	kilo 5.00	40

\*Infants' shoes will be regarded as those up to 16 centimeter long; children's, over 16 and up to 25 centimeters, exclusive; women's, over 25 centimeters; men's, over 25 centimeters.

\*Articles referred to under Nos. 2085 and 2087, if of white rubber, will be valued with a rebate of 30 per cent, according to kind.



Tariff No.	Valuation.	Duties.
	Pesos.	Per Cent.
3509. Garments made of waterproof cotton fabrics.....	kilo 1.00	55
3510. Of waterproof woolen fabrics.....	kilo 2.00	55
3511. Of waterproof silk fabric.....	kilo 4.00	55

## PERU.

Equivalents—Gold libra (£), \$4.86. (A gold libra is divided into 16 sols; 1 sol = 100 centavos.) Kilo, 2.2 pounds; l. w., legal weight; n. w., net weight; g. w., gross weight.

Tariff No.	Duties Per Kilo in
	£. S. C.
<b>PASTES.</b>	
2545. Liquid Rubber (l. w.).....	0 0 40
<b>BELTING, HOSE AND PACKING.</b>	
1768. Hose not elsewhere specified (g. w.).....	0 0 40
2178. Hose of wired rubber, exceeding 10 millimeters in diameter, for draining mines, g. w. per 100 kilos..	Free
2206. Packing, of rubber, in round or cut out pieces, in rings, washers or other special forms.....	Free
2269. Transmission belts of rubber.....	Free
<b>BOOTS AND SHOES.</b>	
630. Footwear of rubber, or with only sole of rubber, with or without other material (l. w.).....	0 1 35
1763. Rubber insoles (l. w.).....	0 1 50
<b>TIRES.</b>	
1763. Bicycle tires (l. w.).....	0 1 50
1767. Automobile tires (g. w.).....	0 1 00

## DRUGGISTS' SUNDRIES.

1763. Teething rings, bands for tooth or nail brushes, tubes for irrigators or nursing bottles (l. w.).....	0 1 50
1764. Buckets, bed-pans, troughs, funnels, urinals and similar articles of hard or vulcanized rubber (l. w.)..	0 1 20
3297. Robes, rubber or tin, dozen.....	0 1 20
3502. Air pillows, cushions and beds, of soft rubber, with or without admixture.....	0 2 00
3317. Abdominal bandages or belts, elastic or not, of cotton, linen or rubber, each.....	0 1 20
3318. Woolen belts, with or without rubber.....	0 6 00
3323. Stomach pumps.....	0 4 00
3325. Bottles of gutta percha, for acids.....	0 2 80
3335. Canulae, of hard rubber, in any form.....	0 2 80
3344. Ear tubes of bronze, brass or rubber, dozen.....	0 4 80
3348. Root cutters and compressors of rubber, each.....	0 1 60
3351. Finger cots, of soft rubber (l. w.).....	0 2 80
3352. Douches, ear, nose, eye and the like.....	0 2 00
3367. Rubber prepared for dentists.....	0 6 00
3369. Rubber gloves (l. w.).....	0 2 80
3375. Syringes, of aluminum and of hard or soft rubber, including irrigators solely of that material, and those called "peraz" (pear) (l. w.).....	0 2 00
3394. Elastic stockings of cotton or other vegetable fiber.....	0 2 80
3395. The same, of silk.....	0 8 00
3391. Nipples for nursing bottles (l. w.).....	0 2 80
3392. The same, with ring, whistle or bells (l. w.).....	0 2 00
3415. Bands of elastic gum, of m. 2 by m. 0.06, dozen.....	0 3 00
3418. Cupping glasses of glass with rubber globe, dozen..	0 4 00

## OTHER GOODS.

50. Cotton tissues, waterproofed with rubber, for floors and for industrial purposes.....	0 0 50
51. The same, for sheets or wearing apparel.....	0 0 75
176. Garters of all kinds, l. w.....	0 2 00
209. Dress protectors, cotton, with or without rubber, l. w.	0 6 00
225. Waterproof clothing, cotton, common, for sailors (l. w.)	0 1 35
226. Other kinds, of any shape (l. w.).....	0 2 25
268. Woolen elastic for footwear, belts, braces or other purposes (l. w.).....	0 1 60
373. Woolen garters of all kinds (l. w.).....	0 2 70
420. Woolen waterproof clothing, rubbered, such as batas, mantles, capes, ponchos, overcoats, and others (l. w.)	0 2 25
465. Elastic for footwear, belts, braces of, fibers other than cotton and wool.....	0 1 70
467. Fabrics of abaca, hemp, flax, pita, jute, etc., rubbered, for floors.....	0 0 50
468. The same, for clothing or sheets.....	0 0 75
613. Waterproof clothing, of the above fibers, common, for sailors.....	0 1 35
657. Silk elastic for footwear, belts or braces.....	0 2 00
662. Waterproofed silk for wearing apparel or for other purposes.....	0 3 20
759. Silk waterproof clothing (l. w.).....	0 4 50
853. Bathing caps (l. w.).....	0 2 70
861. Rubber life preservers (l. w.).....	0 0 90
1763. Erascis, small balloons for carnival or for toys, with or without parts of other material, tobacco pouches, stoppers, and all other similar articles not specially tariffed.....	0 1 50
1765. Rubber cushions for billiard tables (g. w.).....	0 1 00
1766. Key-hole guards, cigar and cigarette holders, cigar cases and match boxes, counters, calls and whistles, card cases and all other similar articles of hard or vulcanized rubber, including napkins rings (l. w.)..	0 2 00
1770. Rubber combs (l. w.).....	0 1 50
1771. Braid combs of rubber, hair pins (l. w.).....	0 5 00
1772. The same, ornamented with other material (l. w.)..	0 7 50
1775. Rubber sheet, openworked or figures, for floors (g. w.)	0 0 60
1776. Plain sheet, combined or not with tissue, cut or in pieces, for the same or other purposes (g. w.).....	0 0 40
1821. Fountain pens.....	0 4 00
1874. Stamps, rubber.....	0 2 80
1887. Rubber type (l. w.).....	0 1 80

Tariff No.	Duties Per Kilo in
	£. S. C.
2434. Wire or cables of copper, less than 3 millimeters in diameter, covered with cotton, gutta percha or other material except those covered with lead or silk, or with flexible cords (g. w.).....	0 0 30
2455. The same of 3 millimeters or more (g. w.).....	0 0 03
2460. Wire or cables of iron or steel, covered with cotton, gutta percha or any other material (g. w.).....	0 0 02
2474. Ebonite plates (g. w.).....	0 0 60
2475. Ebonite tubes or rods (g. w.).....	0 0 80
2621. Toys of rubber, not elsewhere specified (d. w.).....	0 1 25
India rubber (caucho, febe hno, debil) and generally all gums exported, from Peru, shall pay duty at the rate of 8 per cent ad valorem on their market value at Liverpool (July 7, 1911).	

## URUGUAY.

Equivalents—Peso, \$1.04; kilo, 2.2 pounds.

Tariff No.	Duties Per Kilo in
	£. S. C.
<b>HOSE.</b>	
1372. Rubber hose; with or without core.....	1.20 31
<b>BOOTS AND SHOES.</b>	
3376. Rubber shoes, all sizes.....	18.00 48
3378. Clogs, with elastic, for men and women.....	20.00 48
3379. The same, for children.....	11.00 48
3267. Elastic, of pure or mixed silk, for boots and shoes, meter.....	0.50 31
3268. Of wool, wool and cotton or linen mixed, or of pure cotton, for boots and shoes.....	0.32 31

## DRUGGISTS' SUNDRIES.

1501. Air beds, of rubber.....	each 9.60 31
3942. Catheters, rubber.....	dozen 1.80 31
3545. Rubber rings.....	dozen 0.50 31
3946. Rubber cushions, all kinds.....	dozen 18.00 31
3969. Syringe pipes of rubber.....	dozen 1.20 31
4011. Gutta percha funnels.....	dozen 2.40 31
4025. Elastic belts.....	dozen 18.00 31
4097. Injectors, white rubber, assorted, in boxes of one dozen.....	dozen 3.00 31
4098. The same, from No. 0 to 2, inclusive.....	dozen 1.50 31
4099. Of white rubber, in boxes of one dozen, from No. 3 to 5, inclusive.....	dozen 2.50 31
4100. The same, from No. 6 and over.....	dozen 4.50 31
4101. Of green rubber, assorted, in boxes of one dozen, meter.....	5.00 31
4102. The same from No. 0 to 2, inclusive.....	dozen 2.00 31
4103. The same, from No. 3 to 6, inclusive.....	dozen 4.00 31
4104. The same from No. 7 and larger.....	dozen 6.00 31
4184. Rubber pessaries.....	dozen 2.00 31
4250. Breast pumps.....	dozen 5.00 31
4275. Rubber nipples.....	dozen 0.25 31
4281. Rubber tubes of all kinds.....	kilo 3.00 31
4252. Rubber tubes for irrigators.....	dozen 4.00 31
4293. Elastic bandages.....	kilo 3.00 31

## OTHER GOODS.

534. Narrow elastic, of silk or silk and cotton.....	100 meters 1.00 31
545. The same, pure cotton.....	100 meters 0.80 31
597. Rubber aprons, unlined.....	dozen 4.80 48
598. The same, lined, bordered or not.....	dozen 8.50 48
675. Balloons of rubber.....	dozen 0.25 31
674. The same, with or without mouthpiece.....	dozen 1.80 31
711. Leggings, of silk and rubber.....	dozen pairs 20.00 31
712. The same, of rubber or oilcloth.....	dozen pairs 8.00 31
751. Elastics for shirtsleeves.....	dozen pairs 0.60 31
806. Overcoats, waterproof, silk, wool, or cotton.....	dozen 48.00 48
837. Hard rubber combs.....	dozen 0.40 31
844. Small rubber combs, for holding the hair.....	dozen 0.30 31
846. Rubber balls.....	dozen 0.60 31
847. Covered with leather.....	dozen 0.30 31
882. Ponchos of rubber or silk, waterproof.....	each 8.00 48
883. Waterproof wool, or mixture of wool.....	each 5.00 48
884. Waterproof cotton.....	each 5.00 48
898. Rubber cuffs.....	dozen pairs 1.50 31
946. Dress preservers, of rubber and cotton.....	dozen pairs 0.60 31
947. Of rubber and silk.....	dozen pairs 1.00 31
976. Waterproof tissue, coated with rubber or both, or either sides, or between two cloth surfaces, one meter wide.....	meter 1.00 31
1006. Elastic, silk and cotton for garters.....	100 meters 5.00 31
1007. Cotton elastic, for garters.....	100 meters 2.00 31
1747. Rubber erasers, for ink.....	kilo 1.40 31
1748. The same with wooden sheath; also elastic bands.....	kilo 3.00 31
1752. Rubber threads, combined with tissue.....	kilo 0.60 31
1753. Rubber, in sheets, and similar articles for machinery.....	kilo 1.30 31
3734. Refined gutta percha.....	kilo 2.00 48

## VENEZUELA.

Equivalents—Bolívar, \$2.28-36; kilo, 2.2 pounds.

Tariff No.	Duties Per Kilo in
	£. S. C.
<b>CRUDE RUBBER, ETC.</b>	
23. Live plants, including rubber, for cultivation.....	Free
239. Gutta percha, manufactured or not.....	2.50
<b>PASTES.</b>	
250. Rubber, liquid.....	1.25
252. Cement of rubber and benzine.....	1.25
<b>BELTING.</b>	
247. Rubber belting.....	0.75

Rate of Duty (Not Including Surtaxes). Per Kilo.

BOOTS AND SHOES.		Rate of Duty (Not Including Surtaxes). Per Kilo.
Tariff No.		
270.	Rubber shoes .....	2.50
<b>TIRES.</b>		
247.	Tires for carriages and carts.....	0.75
<b>DRUGGISTS' SUNDRIES.</b>		
245.	Teething rings, with or without nipples.....	1.25
250.	Sponges, rubber .....	2.50
263.	Nipples .....	0.25
687.	Rubber cushions for invalids; hot water and ice bags; bulb syringes; abdominal bands, bandages, irrigators, syringes of all kinds, elastic stockings, pessaries, sounds, ligatures, cupping glasses, suspensories.....	1.25
812.	Atomizers and perfume sprayers.....	1.25
<b>OTHER GOODS.</b>		
246.	Portable bath tubs, rubber, and accessories.....	1.25
245.	Washers, rings, with core of cloth, billiard strips, horseshoe pads, and parts of coffee cleaning machines.....	0.75
248.	Manufactures of rubber.....	2.50
249.	Rubber, lined or not, for clothing.....	2.50
251.	Rubberized capes and raincoats.....	2.50
253.	Rubber bands for footwear.....	2.50
256.	Rubber floor mats.....	1.25
258.	Rubber erasers .....	1.25
265.	Artificial plants, of rubber.....	2.50
268.	Tubes, more than 15 millimeters (about 0.6 inch) in diameter .....	0.75
269.	Tubes, less than 15 millimeters in diameter.....	2.50
313.	Cords, cotton, wool or linen with admixture of rubber.....	5.00
542.	Waterproof fabrics of wool and rubber.....	2.50
596.	Waterproof cotton, cloth and rubber, for the manufacture of raincoats .....	1.25
630.	Garters and suspenders of all kinds.....	10.00
901.	Wire, insulated or not, for electrical installations.....	0.25
971.	Fountain pens, with only the pen point of gold.....	2.50

Imports into Venezuela are dutiable on gross weight, i. e., inclusive of the weight of the containers. In case the containers consist of articles specified in the tariff under a higher tariff classification than that of the contents, they are assessed for duty under their own classification.

All dutiable imports are subject to the following surtaxes:

Two surtaxes of 12½ per cent of the duty each, authorized by the decree of April 25, 1901.

A surtax of 30 per cent of the duty, established by the decrees of February 16, 1903, and June 4, 1912. A surtax of 1 per cent, based on the duty increased by the other surtaxes, imposed by the decree of December 29, 1910.

## PEACE PROBLEMS AND PROGRESS.

### PRICE STABILIZATION APPROACHING.

**D**UE to the continued operation of the factors which resulted in the present high prices, stabilization of prices at new levels is approaching, in the opinion of "Commerce Monthly" the magazine of the National Bank of Commerce in New York City.

It is the conviction of the business world that high, or at least rising prices, are evidences of a satisfactory situation, in that they stimulate increased productive and commercial activity. Although the physical adjustment of American production to post-war demands has been more rapid than the most optimistic could have hoped, production has not yet expanded to what must be its normal post-war level.

There is now no fundamental reason to deter production, and not until it has increased to its new peace-time proportions can we rest in the assurance that as far as its effects on our economic life are concerned, the war has passed into history. Not only is production essential, but capital must be accumulated at a rate rapid enough to offset the destruction which took place during five years. The consuming public must recognize that it cannot continue indefinitely the scale of expenditure which followed as a reaction from the self-denial of war, but thrift for personal benefit is as essential as thrift for one's country. When every individual capable of gainful employment is producing to capacity and spending conservatively, our economic adjustment will be complete.

### UNDER-PRODUCTION THE FIRST CAUSE OF HIGH PRICES.

In the report on the causes of the high cost of living published by the Council of National Defense, curtailment in the production of nearly all commodities except raw food products heads the list, and stimulation of production is the first remedy

suggested to improve the situation. That this is assuredly putting matters in their right order is indicated by the facts presented regarding the condition of most industries, and notably with respect to the cotton and footwear situation, both closely identified with the manufacture of rubber goods.

When the war ended the world's cotton supply was below normal and supplies of cotton goods were also low. This year's cotton acreage, however, was about 9 per cent less than for 1918; present prospects indicate a small crop, and producers are expressing gratification because of the high prices they can command in consequence. Meanwhile more spindles have been idle during the first five months of 1919 than during the corresponding period of 1918, despite adequate supplies of raw cotton for this season's requirements and the release of labor by demobilization.

Turning to footwear, it is found that the production of boots and shoes for the first quarter of 1919 was about 60 per cent below that for the last quarter of 1918, the actual difference amounting to some 75,000,000 less pairs.

Such underproduction, due to various causes, notably labor's demand for less work and more pay, has been largely responsible for the rising scale of prices. Prosperity has but one possible basis, however, and that is adequate production of necessities of life, a condition invariably assuring prices fair to all.

### PAMPHLETS ON AMERICANISM.

On "Constitution Day," September 17, many large corporations distributed to their employes hundreds of thousands of copies of a leaflet entitled "The Birthday of Our Constitution," which had been prepared by the National Industrial Conference Board, of which Frederic C. Hood, of the Hood Rubber Co., is treasurer. Like the leaflet "Our Country," which proved so successful on July 4, it was issued as a lesson in practical patriotism in the belief that if our Constitution and system of government were understood and the benefits derived under them by every citizen were known, there would be a better appreciation of individual rights and duties and many radical and even revolutionary ideas would be rejected. It is likely that similar leaflets will be published for distribution on future appropriate occasions.

### MISUSE OF F. O. B. QUOTATION.

The National Foreign Trade Council is calling attention to the abuse of the term "F. O. B. Port," its detrimental effect on American foreign trade, and urging that the correct interpretation of the term at home and abroad be observed by all exporters. Free on board ship was the original meaning of the term and that is the general interpretation among foreigners. It is essential to the best practice for American exporters in making an "F. O. B. Port" quotation to have it mean "F. O. B. Overseas Vessel," but if they mean anything else they should make it clear what services, such as cartage or storage, will be charged to the buyer's account.

### HOMES FOR WESTINGHOUSE EMPLOYEES ON EASY TERMS.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has resumed its home-building program which was postponed during the war, and forty-eight houses are now under construction on a plot of 109 acres in Wilkins township along Ardmore Boulevard. It is estimated this tract will furnish homes for six hundred families. Sidewalks and paving will be laid, and gas, water and electricity installed. The houses will be of brick and hollow tile construction with concrete cellars and cement porches. They will be mostly of five, six and seven-room houses designed to meet the needs and the pocketbook of the man in moderate circumstances and will be sold at cost on easy terms to the employes of the company. A number of the dwellings also will be for rent.

## COTTON IN SOUTH AMERICA.

**A**S BRAZILIAN AND PERUVIAN COTTON helped to make up the deficiency during the war, it is worth while to examine the possibilities of South American cotton. In the first place cotton is indigenous to the soil of what is called Latin-America, and was not introduced by the Spaniards. It is the home of the group of fine cottons which are the best in the world. All cotton roughly comes under three heads: Indian, Upland or American, and Peruvian, which last includes Sea Island, Egyptian, Peruvian, Caravonica and others. The production of Sea Island and Egyptian is now almost wholly outside of South America, but a number of fine cottons are still raised there, mainly in Brazil and Peru.

## COTTON GROWING IN BRAZIL.

In Brazil the possibilities of cotton growing are very great; already in every State along the coast from Pará to São Paulo large areas are devoted to cotton and in some cases the cultivation extends far inland. In Pará, where rubber was the main crop, cotton advanced greatly during the war, and there seems to be no limit to its possibilities. In 1910 the prophecy was made that Brazil might grow 20,000,000 bales; in 1918 she got as far as half a million, apparently. Until the 19th century England drew her supply mainly from the West Indies and South America.

Baines, in his "History of Cotton Manufacture," states that "Brazilian cotton was first imported from Maranhão in the year 1781, but was very dirty. Pernambuco cotton exceeded even that of Maranhão in fineness and goodness of staple; it was much sought after, its cultivation was extended, and it brought the highest price of all cotton except Sea Island." In 1820 29,000,000 lbs. out of 151,500,000 imported into England came from Brazil. American cotton checked the expansion, but in the cotton famine of the '60s there was another spurt, and in 1871 Brazil imported 80,000 tons. Just before the war the crop was about 400,000 bales of 250 lbs. The quality of Brazilian cotton is very good, so that it is hard to understand why the cotton growing industry has not developed.

## BRAZILIAN VARIETIES.

Two main varieties are grown: the perennial tree cotton known as Creoulo or Maranhão, which yields well from the second year and lives 10 or 12 years. It bears open bolls all the year round. The cotton is of very fine quality, long and silky, and may be the parent of all long staple cottons, including Sea Island. It has been free from the insect pests that have made cotton trees unpopular in other parts of the world. The other kind of cotton is the "herbaceous," the annual growth, with short white lint. The chief trouble with Brazilian cotton is that long and short staple are mixed together, and the handling of the gathered crop is very careless. Yet 1,200 lbs. of lint have been raised on one acre; while in Egypt the average is 500 lbs.

It is tantalizing to know that Brazil could produce a crop of cotton as large as the whole world turns out, or that Peru could equal the amount of the Egyptian crop, but possibilities do not mean that anyone will try to turn them into realities. The present price of cotton may act as a stimulus.

## PERUVIAN COTTON.

In Peru the climatic conditions are different and resemble those of Arizona and California, where cotton is grown. There are two varieties: Smooth Peruvian, which is about 65 per cent. of the crop, has a staple not over an inch in length, but strong and of good color. Rough Peruvian, which makes up the other third of the crop, is a perennial or tree cotton, and lives as long as 20 years. The staple is from  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches long, and can hardly be distinguished from wool. The price seems to be fixed independently of all other cottons. Besides these some Sea Island and some Egyptian cotton is grown; the latter often com-

mands a higher price in Liverpool than real Egyptian. So far Peruvian cotton has been immune from pests. All that was raised, however, just before the war was 130,000 bales of 500 pounds. The development of the crop would call for capital to build irrigation works; but there seems to be no reason why the expenditure should not be very profitable.

## COTTON IN OTHER COUNTRIES.

In Argentina the cotton possibilities are also very good; the conditions are as favorable as in Brazil, and the experiments with Egyptian cotton were successful. The chief difficulty is in obtaining sufficient labor. Little seems to have been done in Venevuela, Colombia or the Guianas, where the possibilities are also good.

## THE FRENCH COTTON TEXTILE INDUSTRY.

In 1913 France imported 1,453,256 bales of raw cotton, of 500 pounds each, 1,101,953 of which came from the United States, 130,073 from Egypt and 111,780 from British India. In 1917 the imports were 1,203,930 bales. The annexation of Alsace should increase the normal imports of raw cotton by at least 300,000 bales a year.

French imports and exports of cotton yarn for four years, up to and including 1916, the last year for which official figures can be obtained, were, in metric tons, as follows: 1913, imports 4,251, exports 9,063; 1914, imports 2,499, exports 3,802; 1915, imports 37,252, exports 1,980; 1916, imports, 81,954, exports 3,457.

Before the war France produced 6 per cent. of the world's output of cotton fabrics. The production of cotton fabrics increased remarkably between 1910 and 1912—from 120,000 to 225,000 metric tons. In 1913 France manufactured 220,000 metric tons, imported 4,392 metric tons (mostly from England and Germany), and exported 50,613 metric tons, of which more than one-half went to the French colonies. The following table shows the French production, imports, exports and consumption of cotton fabrics for the four years up to and including 1916, the latest year for which accurate figures are available:

	Production.	Imports.	Exports.	Consumption.
1913 .....	Metric tons 220,000	4,392	50,613	173,780
1914 .....	133,000	4,679	26,368	111,311
1915 .....	218,090	35,669	21,391	232,368
1916 .....	214,000	37,366	24,180	227,186

Owing to the abnormal conditions which are likely to prevail for the next few years at least, it is difficult to estimate the future of the French cotton-weaving industry. However, the number of French looms has been increased by 46,000 by the return of Alsace, making a total of 186,000 looms, if we figure the previous French total at 140,000, or an increase over 1913 of 33 per cent. The production of cotton fabrics, if it should increase in the same proportion, would amount to 292,600 metric tons, which, allowing for Alsatian consumption, would mean an exportable surplus of over 92,000 metric tons per year. ("Commerce Reports," July 30, 1919.)

## A SEA ISLAND COTTON PROJECT.

The Mermentau Mineral Land Co., Inc., whose headquarters are at New Orleans, Louisiana, is making good progress in cultivating Sea Island cotton on its 14,000-acre tract of reclaimed land opposite Grand Chenière on the Mermentau River in that state.

The first acre was planted three years ago and nearly a thousand pounds of seed cotton were gathered. This was such a good yield that the plot was extended to ten acres, with a result as satisfactory. Last year five small farmers in the vicinity were induced to plant from this seed, with the result that they raised 28,000 pounds of excellent cotton with exceptionally long staple. This spring 250 acres were planted and a gin erected, and if the season's results warrant, the entire tract will be devoted to cotton and cattle raising.



## American Chemical Society.

### RUBBER DIVISION MEETING.

THE FIRST MEETING of American rubber chemists, organized as the Rubber Division of the American Chemical Society, took place at the fifty-eighth meeting of the Society at Philadelphia, September 2-6, 1919. A large and representative delegation of works chemists and others was in attendance and much interest manifested in the papers presented.

Charles L. Parsons, secretary of the American Chemical Society, in a few well-chosen remarks, congratulated the American rubber chemists on their organization as a distinct division of the Society and predicted great benefit to the cause of science and the welfare of the rubber industry when the realization becomes general that the manufacturer who secludes his processes as secrets is certain some day to awaken to the fact that he is failing to support his own interest by holding back in the interchange of ideas.

The Committee on Physical Testing, H. E. Simmons chairman, reported recommendations on tentative methods for the physical testing of vulcanized rubber goods. These included sampling, test pieces, physical tests, testing machine and computations. The tests described are for tensile strength and friction, and hydraulic and steam endurance tests on various types of hose and for belting, packing, gaskets, etc.

The report was accepted and referred to the Rubber Division for criticism and future adoption.

"A New Method for the Determination of Sulphur in Rubber Mixtures," by G. D. Kratz, A. H. Flower, and Cole Coolidge, was read by Mr. Kratz, who reviewed the methods of Esch, Spence and Young, and of Tuttle and Waters, and gave in detail the procedure of the new method, by which it is possible for one person to make 50 determinations of sulphur per week of 44 hours, together with other work. A single determination requires four hours' work.

"The Extraction of Rubber Goods" was presented by S. W. Epstein and B. L. Gonyo, of the Bureau of Standards. The solvents considered were (1) chloroform, (2) acetone (45) and carbon disulphide (55); and acetone (40) and chloroform (60), and a tabulation of results was shown indicating the relative efficiencies of the solvents following initial extraction of the vulcanized rubber sample for eight hours with acetone. The advantage of the mixed solvents was marked and somewhat in favor of the acetone-carbon disulphide mixture.

"The Theory of Balloon Fabric Protection" was briefly treated by the division chairman, Dr. John B. Tuttle. Balloons are classified in Army service as:

(1) Nurse balloons, capacity 5,000 cubic feet. These are used for transporting supplies of gas only.

(2) Kite balloons, capacity 160,000 cubic feet. They are used as captive observation balloons, requiring low visibility as targets and weather-proofing to withstand at least sixty days' exposure.

(3) Dirigible balloons, capacity 165,000 cubic feet, requiring practically the same protection as kite balloons.

Specifications of weights and constructions were given for fabrics for each sort of balloon named, including dyed plies and outside aluminum coating for protection against the heat and actinic rays of the sun.

A paper by Mr. W. W. Evans on "Balloon Seam Construction and Cements" embodied the results of experimental studies at the B. F. Goodrich plant. The temperature of the inside of a balloon is from 20 to 25 degrees F. higher than that of the outside air. This temperature can be lowered about five degrees by an outside coating of aluminum. A stock cement was used, consisting of specially washed Pará dissolved in 50 per cent

by weight of benzol. A series of working cements prepared from this, using various rubber and resin ingredients, was investigated. A certain proportion of resin was proved advantageous, also cold vulcanization at the time of making the seam. Seams are cemented and lapped three-quarters of an inch, wiped with a solution of one-half per cent solution in a mixture of equal parts of carbon tetrachloride and benzol, and rolled in contact. The seams are reinforced by the application of cemented strips 1-½ inches wide on the outer balloon surface and two inches wide on the inside.

Discussion of Dr. Tuttle's and Mr. Evans' papers developed that on account of the shortage of rubber during the war the Germans were compelled to use cellulose acetate and dyed fabrics in balloon construction. In point of efficiency American practice in the balloon fabrics and rubber construction was equal to that of any other nation.

The expansion of rubber compounds during vulcanization has been studied experimentally by C. W. Sanderson. A volume of one cubic inch was placed in a cylindrical cavity. Temperature increase of five degrees F. per 20 minutes was applied by means of a surrounding steam atmosphere. The rubber was free to expand upward only against the force of a graduated spring and this motion communicated to a recording device modified from a steam engine indicator. Springs of 10, 50, and 100 pounds strength were used. The ten-pound spring was not sufficiently strong to prevent porosity in the sample. The results showed that the higher the quality of the rubber compound the higher was the coefficient of expansion. After the first 15 minutes of heating, the recorded curve of expansion became a straight horizontal line. Fine Pará shows a slower expansion than brown crêpe. Milling increases the rate of expansion and over-milling will deteriorate fine Pará in this respect to the expansion rate of brown crêpe. The increase of specific gravity in cured over uncured rubber compositions is due to elimination of contained air. The contraction of a rubber compound after cure is greater than its expansion during cure.

A paper on "The Volume Increase of Compounded Rubber Under Strain," by H. F. Schippel, was particularly interesting and illustrated by a simple and striking experiment. The theory was advanced that under strain the rubber in a cured rubber mixing is drawn away from each particle of mineral matter, forming vacua on opposite sides of the particle. This condition results in a distinct increase in volume varying with the elongation and is made evident experimentally by an apparent decrease of specific gravity.

The experiment used in illustration was as follows: a cured high-grade compounded ring, suitably proportioned as to diameter and weight was stretched over a short cylinder of paraffine and a light elastic band snapped over both. This combination was seen to float in a tall glass vessel of water. That the floating effect was due entirely to the presence of vacua formed by stretching the ring over the paraffine plug was demonstrated by removing the ring from its strained position and holding it in place on top of the paraffin, retaining it there by means of the same elastic band. When placed in water the combination slowly sank to the bottom of the vessel, due to the lessened volume of the unstrained ring by the elimination of the vacua.

J. H. Scott led a symposium on "The Action of Accelerators During Vulcanization." His paper was a comprehensive review of the work of Dr. Spence and himself on the effect of sodium hydroxide, soda-lime and piperidine. The ideal catalyst is one the minimum quantity of which will give the maximum stimula-

tion to the reaction combining sulphur with rubber. Nitrogenous compounds are the most active catalysts.

The paper of G. D. Kratz, A. H. Flower and Cole Coolidge on "The Action of Certain Organic Accelerators in the Vulcanization of Rubber" treated on substances all of which have been discarded in their practice for various reasons. The accelerating effect was determined in percentage proportion for each catalyst treated referred to that of aniline as standard. Anhydrous formiline was rated at 75 and of para-phenylene-diamine at 17. Accelerators should be used in proportions based on their molecular weights.

C. W. Bedford and Winfield Scott on "Reactions of Accelerators During Vulcanization" illustrated these reactions by graphical formulae. The opinion was expressed that thiocarbonyl is the most widely used accelerator in American practice today. The presence of zinc oxide has a very marked influence in aiding the action of thiocarbonyl. The effect of this accelerator is not due to its splitting off aniline.

D. F. Cranor spoke on "The Effect of Organic Accelerators on the Vulcanization Coefficient" with special reference to hexamethyl-tetramine and thiocarbonyl, using mixings of smoked sheets 100; sulphur 6; zinc oxide 1, and one-half of one per cent of hexamethyl-tetramine and thiocarbonyl. Brown crepe will not cure satisfactorily without the use of accelerators. The presence of zinc oxide is found desirable to activate the accelerators.

The discussion on the above papers on accelerators was very brief. Dr. L. E. Weber asked if the action of the catalyzer on the vulcanization of rubber with sulphur is considered as apart from the polymerizing effect taking place in the rubber. To this, J. H. Scott replied that a catalyst may take part in both vulcanization and polymerization, but does not necessarily polymerize the rubber.

G. D. Kratz in answer to a question explained that his views were in substantial agreement with those of Ostromislensky on vulcanization.

The essentials of a procedure for the determination of cellulose in rubber goods was considered by S. W. Epstein and R. L. Moore and details of a proposed method given. This method is conducted in three stages: (1) digestion for four hours in cresol, (2) treatment with hot ten per cent solution of hydrochloric acid, (3) acetylation of the cellulose. The loss of weight due to acetylation represents cellulose.

Reviewing and summarizing the investigations of Eaton, Grantham and Day; H. P. Stevens; and Philip Schidrowitz, Dr. J. B. Tuttle in his paper on "The Variability of Crude Rubber," stated that this variability is measured by the differences in effect of the accelerating substances natural to the latex or formed in the crude rubber during preparation and the retarding agencies introduced, as for example by smoking. Such variations in curing quality are overcome in practice by the use of two to four per cent of litharge or one-half to one per cent of ordinary organic accelerators, such as aniline or hexamethyl-tetramine. The work of Eaton shows the variation the natural accelerators present and not the variation of the rubber itself.

Dr. Tuttle expressed the view that tensile strength compared to rate of cure determines the value of a rubber in practical use. For example, a slow-curing rubber with low tensile strength can be rendered satisfactory for use by the addition of an accelerator which will increase its speed of vulcanization and raise its tensile to that of a rubber naturally possessing these qualities.

D. C. Cranor advocated the use of the load required to produce a standard elongation as the determining factor in practical evaluation of crude rubber under manufacturing conditions. Mr. Postmontier suggested that the executive committee of the Rubber Division take under consideration and later report practical methods of testing the variability of crude rubber

under conditions prevalent in the manufacture of rubber goods.

H. P. Gurney, in considering "Some Methods of Testing the Hardness of Vulcanized Rubber," compared the durometer of Shore; the plastometer of Pusey and Jones; the resiliometer of Widney, and the densimeter of the Boston Belting Co. Hardness of rubber was defined as the force required to displace a unit volume of rubber and may be expressed by the formula:

$$H = \frac{M}{L^2 T}$$

H, indicates hardness; M, mass; L, the load applied, and T, duration of time of load application.

"The Manufacture and Use of Crimson Antimony" was briefly treated by J. M. Bierer, who reported that the most practical method found after extended study was by the formation of antimony chloride by direct action of chlorine on the metal and subsequent conversion of the product into antimony tri-sulphide.

"Carbon Black—Its Properties and Uses," by G. St. J. Perrott, read before the Division of Industrial Chemists and Chemical Engineers, was by request of Dr. Tuttle read again before the Rubber Division. General description of the manufacturing process and machinery employed was given and illustrated by lantern slides. Carbon black has many industrial uses, the chief of which is the manufacture of printing inks and rubber goods, 10,000,000 pounds annually being used in printing ink and 20,000,000 pounds annually in rubber goods, chiefly in tires. The form of apparatus used in the condensation of the black from the burning gas produces either "short" or "long" black, so called because of the short buttery consistency of the preparation of oil and black in printer's ink or the opposite tendency of the mixture to draw out when separated between the thumb and finger. By microscopic examination the difference is seen to be due to a tendency in the case of "long" black for the particles of the pigment to agglomerate. The diameter of carbon black particles varies from 75 to 100 millimicrons.

A short descriptive paper, "Research on Zinc Products for the Rubber Industry," was presented by P. R. Croll and I. R. Ruby.

Owing to the length of the program of papers and for other reasons the following were omitted or read by title: C. Olin North, "The Effect of Compounding Ingredients on the Physical Properties of Rubber." (Omitted.) "Symposium on the Testing of Pigments." (Omitted.) C. P. Fox, "Laboratory Aprons." (Omitted.) H. E. Simmons, "The Value of a Library to the Rubber Laboratory." (By title.)

All papers read at the meeting are subject to the rules of the American Chemical Society and will not be published until released by that body.

The report of the Fruit-Jar Committee was filed. The efforts of manufacturers and leading jobbers to educate jar-ring users was endorsed and dependence on their guaranties advised. The committee endorsed the recommendations of the United States Bureau of Agriculture, States Relation Section, on jar rings, with tests, adapted for use at the counter and in the kitchen for determining jar-ring quality. Another test was added, namely, pinching the flange of the ring folded each way. The rubber should not show cracking under this treatment.

The sessions of the Rubber Division closed with the election of the following officers for the ensuing year.

CHAIRMAN: Dr. W. K. Lewis, Massachusetts Institute of Technology.

VICE-CHAIRMAN: George D. Kratz, Falls Rubber Co.

SECRETARY: Arnold H. Smith, The Goodyear Tire & Rubber Co.

EXECUTIVE COMMITTEE: J. M. Bierer, Boston Woven Hose & Rubber Co.; W. W. Evans, The B. F. Goodrich Co.; C. W. Sanderson, The Fisk Rubber Co.; J. W. Scott, Plexus Tire & Rubber Co.; George Oenslager, The B. F. Goodrich Co.

## What the Rubber Chemists Are Doing.

### THE NATURE OF VULCANIZATION.

By Dr. H. P. Stevens.<sup>1</sup>

#### PART I.

#### THE COMBINATION OF RUBBER WITH SULPHUR.

TWO THEORIES have been put forward to explain the change which takes place in the physical and chemical properties of rubber when vulcanized. According to one theory, vulcanization is primarily an adsorption process; according to the second, a chemical reaction is involved, the sulphur entering into a chemical combination with the rubber hydrocarbon. It would, however, appear that those who uphold the physical theory admit the possibility of a subsequent chemical combination of the rubber and sulphur taking place, while the supporters of the chemical theory admit that adsorption of the sulphur may precede chemical combination. It remains to be shown whether or no the technical effect of vulcanization can be produced without any chemical combination between sulphur and rubber hydrocarbon taking place.

The systematic researches of Spence and his collaborators (*"Kolloid Zeitschrift,"* 1911, 8, 304; 9, 300; 1912, 10, 300; 11, 28, 274; 1913, 265), which in the main have been corroborated by later work, clearly show that sulphur enters into chemical combination with rubber during the ordinary vulcanizing process as, for instance, when a mixture of rubber and sulphur is heated for an hour or two at temperatures such as 130 degrees—150 degrees C. The velocity of the reaction is proportional to the time of heating at a constant temperature; the temperature coefficient normally lies between 2 and 3 (*Ibid.*, 11, 32), but is considerably influenced by catalysts (the so-called accelerators).

More recently the subject has been studied by Harries and Fonrobert (Berlin, 1916, 49, 1196, 1390); these authors, without controverting the work of Spence, claim that vulcanization is essentially a physical process and that vulcanized rubber can be prepared which is free from combined sulphur. This conclusion is based on one vulcanizing experiment only, carried out on a rather large scale. The acetone-extracted vulcanizate was practically free from sulphur. In the course of my own work on vulcanization I have made numerous sulphur estimations in acetone-extracted vulcanizates but have never obtained a figure comparable to that of Harries. It was therefore thought advisable to carry out a control of Harries' vulcanization experiment before proceeding with further research.

There are several points in regard to Harries' experimental procedure which are open to criticism. The rubber was mixed with 10 per cent of sulphur and disks vulcanized for a short time ( $\frac{1}{2}$ -hour) at a fairly high temperature (145 degrees C.). The thickness of the disks is not given but, as these were used for tensile tests with a Schopper machine, they were probably 5–6 mm. thick so as to give a ring of standard size. It is doubtful whether sufficient time was given for the heat to penetrate evenly through so thick a layer of rubber, and it is probable that the outer layers were more fully vulcanized than the inner parts of the disks. It is stated that the conditions of vulcanization were similar to those technically used in the manufacture of inner tubes, but these latter usually contain an appreciable proportion of antimony sulphide in addition to the sulphur which facilitates the conduction of heat through the mass, also of "accelerators" which are capable of reducing the time required for vulcanization from one-half to one-third of that otherwise required. It is stated that the physical qualities of the vulcanized rubber were satisfactory, but the tensile figures are not given and the fact that the rubber became soft and sank together during extraction

points to very incomplete vulcanization. This does not happen with moderately under-vulcanized rubber. Harries and Fonrobert extracted a large quantity (500 grms.) with acetone for a long period (60 days).<sup>2</sup> At the end, the rubber contained only 0.29 per cent of sulphur. It was assumed that, given sufficient time, this residue would eventually have been removed and therefore the sample may be said to contain no combined sulphur. Owing to the large amount of rubber taken for extraction and the defects of the extraction apparatus, it appeared probable that this result would be more quickly obtained by the extraction of small samples, rolled very thin, using a form of apparatus in which extraction takes place at the boiling point of acetone (Analyst, 1913, 38, 143).

I determined therefore to vulcanize a mixture of Para<sup>3</sup> rubber and 10 per cent of sulphur under the same conditions as employed by Harries, that is for 30 minutes at 145 degrees C., but in the form of a thin sheet  $\frac{1}{2}$ –1 mm. thick so to obtain uniform vulcanization. At the same time a second experiment was made with the same mixture of rubber and sulphur, vulcanizing for 19 minutes only. It is well known that Para rubber from different sources varies in rate of vulcanization. The experiments were therefore extended to include a sample of fast vulcanizing plantation Para rubber. Approximately one-quarter of each sample was removed after 1, 2, 4, and 9 weeks, extraction (1 week = approximately 50 hours), and the sulphur estimated with the following results:

#### PARA RUBBER A VULCANIZED IN STEAM AT 145 DEGREES C.

Period of extraction.	Combined sulphur per cent.	
	(1) 30 min.	(2) 19 min.
1 week .....	1.54	0.94
2 weeks .....	1.54	0.96
4 weeks .....	1.47	0.95
9 weeks .....	1.55	0.96

#### PARA RUBBER B.

(3) and (4) were vulcanized to correspond with (1) and (2) above. They were extracted for periods of 2 weeks and 9 weeks.

Period of extraction.	Combined sulphur per cent.	
	(3) 30 min.	(4) 19 min.
2 weeks .....	1.11	0.67
9 weeks .....	1.08	0.70

#### FAST VULCANIZING PARA RUBBER C.

This sample was treated similarly to B.

Analyses were made in duplicate.

Period of extraction.	Combined sulphur per cent.	
	(5) 30 min.	(6) 19 min.
2 weeks .....	{ 2.69	1.40
	{ 2.33	1.53
	{ 2.39	1.47
9 weeks .....	{ 2.33	1.46

The vulcanized specimens were subjected to physical tests. Ring-shaped test pieces gave the following results—

Rubber sample.	Time of vulcanizing (minutes).	Breaking strain, grms. per sq. mm.	Final length (original length=1).
(1) A.....	30	830	10.7
(2) .....	19	490	11.2
(3) B.....	30	750	11.1
(4) .....	19	290	12.2
(5) C.....	30	1300	10.8
(6) .....	19	890	11.2

With regard to these figures, the breaking strain of (5) is only a little below that normally given for a fully vulcanized Para rubber. This sample contains about 2.4 per cent of combined sulphur whereas a fully vulcanized rubber usually contains 2.8–3 per cent calculated on the rubber (coefficient of vulcanization). The breaking strains of (1) and (3) are not much over one-half of what would be obtained if fully vulcanized. The

<sup>1</sup> Dr. H. P. Stevens in "The Journal of the Society of Chemical Industry," July 15, 1919.

<sup>2</sup> Presumably the extraction was not carried on during the night as the apparatus was leaky. Sixty days may therefore be taken to represent about 500 hours.

<sup>3</sup> That is, derived from *Hevea brasiliensis*.



final length (length at the moment of rupture) corresponds throughout with the breaking strain and tends to give a lower figure, the higher the breaking strain. It may be said that (1) and (3) are quite typical of a moderately under-vulcanized rubber. All vulcanized specimens, even those vulcanized for 19 minutes only, swell but do not dissolve in cold benzene.

These analytical results show clearly that, within the limit of accuracy of the sulphur estimations (the rubber being in the form of thin sheet), the whole of the so-called free sulphur is extracted in two weeks. A further seven weeks' extraction did not reduce the amount of combined sulphur. To judge from the figures for the rubber A, the extraction of free sulphur is complete in one week (say 50 hours), and for technical work a 5-10 hours' extraction is usually regarded as sufficient.

These results are in total disagreement with those obtained by Harries and Fonrobert. All three specimens of raw rubber contained over 1 per cent of combined sulphur after 9 weeks' extraction when cured for 30 minutes at 145 degrees C. (45 pounds steam pressure), whereas Harries and Fonrobert obtained only 0.29 per cent under less favorable conditions for the extraction of the free sulphur. When vulcanized for only 19 minutes, the figures for combined sulphur are more than double those obtained by Harries and Fonrobert. One can only conclude that these investigators were working with an excessively slow vulcanizing and inferior quality of rubber or that, owing to the thickness of the disks used and the short time of vulcanization, or for some other reason, the rubber was only surface vulcanized. It appears therefore that the technical effect of vulcanization has not been obtained without an appreciable amount of sulphur becoming insoluble in acetone, that is presumably combined with the caoutchouc hydrocarbon.

#### PART II.

##### THE ACTION OF SOLVENTS ON VULCANIZED RUBBER.

Although the process of vulcanization is of enormous technical importance, it is not possible to formulate a definition of vulcanization which will enable a sharp distinction to be drawn between a vulcanized and an unvulcanized rubber. Technically, vulcanization produces a physically improved product, showing greater indifference to changes of temperature and greater tensile strength and elasticity. Of the ordinary soft vulcanized goods, 2-4 per cent of the sulphur cannot be extracted with acetone—the so-called combined sulphur. By "undervulcanizing," the amount is smaller and the product is softer and physically weaker, as already shown in Part I. If the vulcanization be carried to its limits, hard resilient solid (vulcanite or hard rubber) is produced, and up to 32 or 33 per cent of sulphur may remain undissolved after prolonged acetone extraction.

Solvents such as benzene and carbon bisulphide are frequently employed to differentiate between vulcanized and unvulcanized rubber (compare Harries, Berlin, 1916, 49, 1196), on the assumption that vulcanized rubber is insoluble and unvulcanized rubber soluble, but tests with different solvents under different conditions showed that the "solubility" of vulcanized rubber in organic solvents is dependent on (1) the nature of the solvent, (2) the time of immersion in the solvent, (3) the temperature, (4) the degree of vulcanization, and (5) the age of the vulcanized specimen. I have already remarked on the progressive solubility in benzene of rubber "vulcanized" with benzoyl peroxide ("Journal of the Society of Chemical Industry," 1917, 109), the rubber tending to insolubility in benzene with intensification of the vulcanizing conditions as, for instance, by increasing the proportion of benzoyl peroxide. Vulcanization with sulphur and with benzoyl peroxide is therefore analogous as regards the physical properties and solubility of the vulcanizate.

**RAW RUBBER.** It is generally assumed that raw rubber is soluble in solvents such as benzene and carbon bisulphide, but in many cases the solubility is only partial after months of

immersion in the solvent. It is necessary to distinguish between:

(a) Rubber obtained by evaporation or coagulation without mechanical working—at the most, a pressing of the clot to expel part of the mother liquor and facilitate drying. To this class belong the so-called plantation sheet rubber, "fine Pará," and most wild sorts.

(b) Rubber which has been worked (crêped) after coagulation in the moist state or by subsequent working (mastication) of the dry rubber of the type described under (a). The working, whether crêping or mastication, is accomplished by passing the rubber through differentially geared rollers.

Rubber in category (a), when immersed in a solvent, swells considerably unless of low quality, i.e. degraded<sup>4</sup> rubber which is soft, adhesive, or even semi-fluid, owing to unsatisfactory treatment in preparation or preservation. Taking the case of plantation sheet or dry Pará rubber, the rubber swells enormously and gradually passes into solution, the mass of rubber retaining its swollen skeleton form. After a long period and treatment with fresh solvent, the skeleton may collapse, leaving a slimy deposit rich in nitrogen. It is probable that the retention in shape and only gradual dissolution is caused by a network of protein films formed when the rubber is coagulated. This is particularly the case with rubber coagulated with tannin or products containing tannin which act on and toughen the protein films. The reticulated structure of these films is microscopically visible if thin pieces of the rubber are swollen in benzene with due care.

Rubber in category (b) readily dissolves in benzene; the amount of swelling depends on a variety of circumstances, including the degree of working to which it has been subjected.

Caspari ("Journal of the Society of Chemical Industry," 1913, 1041), separated samples of rubber into a soluble and a "pectous" variety by prolonged extraction with petrol ether in the cold. I have repeated Caspari's experiments but was unable to obtain concordant results in repeat extractions. The proportion of soluble to "pectous" appeared to depend on the period of extraction. Moreover, I found that the "pectous fraction," if allowed to stand sufficiently long in cold petroleum spirit, dissolved wholly with the exception of a small quantity of slimy nitrogenous matter which settled to the bottom of the containing vessel, so that the behavior of petroleum spirit as a solvent differed from that of benzene in degree and not in kind. Petroleum spirit is merely a less effective solvent than benzene.

Raw and vulcanized rubber exhibit varying behavior when immersed in a solvent. This should be noted as indicating the degree of "solubility." The most readily soluble rubber dissolves with little or no swelling, almost like a crystalloid. A less easily soluble rubber swells before dissolving. As the volume of the gel increases, more difficulty is experienced in producing a permanent emulsion with excess of solvent. Vigorous shaking is necessary and eventually one arrives at a stage when gelatinous flakes remain "undissolved." This marks the limit of "solubility." Beyond this stage, the more fully the rubber is vulcanized (i.e., the higher the percentage of combined sulphur), the less the rubber swells in the solvent.

**VULCANIZED RUBBER.** No investigations have been published dealing with the solubility of vulcanized rubber in solvents such as benzene and carbon bisulphide. The general impression is that vulcanized rubber is insoluble in contrast to the solubility of raw rubber. In connection with the previous paper it was important to ascertain the lower limit of combined sulphur which would confer the property of insolubility in organic solvents. Preliminary experiments showed that the quantity of combined sulphur required to confer insolubility as above defined was very small, and it was therefore found impracticable to vulcanize at the previous temperature of 145 degrees C. as the

<sup>4</sup> The term "depolymerized" is usually employed, but this presupposes a molecular change for which proof is wanting. I therefore prefer the term "degraded."

time of heating was too short and the temperature of the steam digester could not be raised sufficiently rapidly to enable accurate measurements to be made of the time of heating. Therefore a lower temperature was chosen. Specimens consisting of 90 parts of raw rubber and 10 parts of sulphur were vulcanized for 30, 40, 50, and 60 minutes at 125 degrees C., at which temperature the rate of vulcanization was reduced to about one-seventh of that at 145 degrees C.

The following figures were obtained after exhaustive extraction of the vulcanized specimens with acetone at the boiling point:—

Minutes Vulcanized at 125 Degrees C.	Sulphur Per Cent.
(1) 30 .....	0.27
(2) 40 .....	0.39
(3) 50 .....	0.45
(4) 60 .....	0.54

These figures show that the percentage of combined sulphur is approximately proportional to the time of heating, as in the case of more fully vulcanized rubber.

After standing 24 hours, small pieces of the vulcanizates were allowed to swell in benzene overnight. On shaking, (1) dissolved readily, giving an apparently homogeneous solution; (2) appeared to be only partly dissolved and the solution was ropy; (3) gave a swollen mass which was broken up on shaking, gelatinous lumps remaining visible; (4) was unaffected by shaking, the swollen mass remaining unbroken. We have therefore the transition states between solubility and insolubility of the vulcanizate in benzene, and according to Harries, (1) might be taken as the unvulcanized or metastable form, while (4) certainly represents the stable or vulcanized form. On this basis about 1/2 per cent. of combined sulphur is sufficient to confer the property of insolubility in benzene.

(To Be Continued)

#### SWELLING OF RUBBER IN SOLVENTS.<sup>1</sup>

For rubber, the rate of swelling in a solvent depends on the nature of the liquid used; the origin and purity of the rubber; the coefficient of vulcanization, and the temperature. The rate and extent of swelling are believed to provide a more rapid and reliable indication of the "nerve" of rubber that is given by viscosity measurements. Most of the materials present in technical raw rubbers, such as resins, do not interfere with the "turgescence" curve, but the natural proteins retard arrival at the critical point at which the rubber loses its tenacity and resistance to stretching, and it is claimed that their quantity can be estimated from this effect.

With vulcanized rubber, the greater the proportion of mineral fillers and of factice the more rapidly this "critical point of turgescence" is attained. Decrease in the proportion of rubber and increase in that of sulphur diminishes the rate of swelling. The rate of swelling may be measured gravimetrically or volumetrically. The latter being more convenient. A modification of Justin-Mueller's apparatus for the examination of cotton during mercerization ("Journal of the Society of Chemical Industry," 1914, page 1201) is recommended for this purpose.

The order of various solvents in their effect on vulcanized rubber has been found experimentally to be tetrachloroethane, carbon disulphide, carbon tetrachloride, petroleum spirit (boiling at 158-212 degrees F.), and benzene. The rate of swelling in the boiling solvents or their vapors is much greater, but the results for the various solvents are less comparable, due to the differences in temperature. The advantage of tetrachloroethane over carbon disulphide at the same temperature is only slight by volume, but much greater by weight. The relative positions of petroleum spirits and benzene are reversed if the swelling is measured by increase in weight.

The values of the swelling constant,  $x$ , calculated by Kirchoff's

formula  $Q = KSx$ , where  $S$  is one hundred times the specific gravity of the solvent,  $K$  the volume before swelling, and  $Q$  the maximum volume, were found to be as follows:

Solvent.	Swelling Constant.
Tetrachloroethane .....	2.107
Carbon tetrachloride .....	1.872
Carbon disulphide .....	1.747
Benzene .....	1.672
Petroleum spirit .....	1.245
Heptane .....	1.727
Tetrachloroethylene .....	2.072
Pentachloroethane .....	1.987

#### PREPARATION OF RAW RUBBER.

In reviewing recent investigations on the production of raw rubber, E. de Wildeman finds that fine hard Para is generally not superior to plantation rubber. In the preparation of plantation rubber it is advisable to avoid excessive dilution of the latex; use the least quantity of coagulant; use bisulphite, and smoke the rubber at not exceeding 55 degrees C. (133 degrees F.). Smoking should begin one day after milling the rubber and continue for two weeks after the rubber is dry. Sheet rubber is superior to crêpe, and the latter is better thick than thin. It is recommended that as few forms of rubber as possible be made and preference is given to smoked sheet. ("Le Caoutchouc et la Gutta-Percha," volume 16, 1919, pages 9826-29.)

#### COAGULATION OF HEVEA LATEX.<sup>2</sup>

Reviewing the researches on latex coagulation, G. Vernet shows that the results obtained with latex preserved by the addition of ammonia may be very misleading, and that it is necessary to use fresh latex. This may account for some of the results by the advocates of the enzyme theory of coagulation.

Regarding the various theories advanced by others, the author concludes that the function of the protein constituents of the latex is of first importance in coagulation. All the experiments made in this connection can be explained by the reactions of these proteins. Coagulation results from an insoluble condition of the proteins. Drying and centrifugal separation are not alone able to produce coagulation, but may assist separation in presence of ordinary coagulants. Without the use of coagulants these processes simply increase concentration of the latex and gradual coalescence of the rubber globules, leaving the proteins entirely removable by washing. While the possible activity of enzymes during spontaneous coagulation of latex cannot be denied, it is significant that their presence has not been directly demonstrated and that coagulation can be explained satisfactorily without assuming their existence.

Latex below 39.2 degrees F. can be preserved perfectly for more than a month, and by tapping with careful exclusion of micro-organisms and collecting in sterilized glass tubes it is possible to obtain samples which remain liquid a month or more.

Spontaneous coagulation can be satisfactorily obtained with ordinary latex by adding one to ten grams of sugar per liter, excluding air during coagulation and maintaining the temperature at 86 to 113 degrees F. Serum from a previous coagulation or a selected growth of micro-organisms may be employed as a further aid. Latex so treated will coagulate with perfect evenness if diluted with several times its bulk of water.

#### CHEMICAL PATENTS.

##### THE UNITED STATES.

**PRESERVATIVE COMPOSITION** for treating rubber fabric, comprising a mixture of tar, pitch, resin, rubber cement, fish glue, glycerine, and turpentine. (Richard E. Thierfelder and John Schmälzle, Jr., Milwaukee, Wisconsin. United States patent No. 1,312,007.)

**PROCESS FOR VULCANIZING RUBBER**, which comprises mixing an organic vulcanizing agent and red lead with rubber and vulcan-

<sup>1</sup> A. Dubosc. "Le Caoutchouc et la Gutta-Percha," 1919, pages 9781-9783; 9813-9819.

<sup>2</sup> "Le Caoutchouc et la Gutta-Percha," 1919, pages 9835-9844.

izing the mixture. (Sheldon P. Thacher, Weehawken, New Jersey, assignor to Revere Rubber Co., Providence, R. I., United States patent No. 1,312,144.)

**METHOD OF RECOVERING RUBBER SOLVENT** in the manufacture of articles by the dipping method. The dipping form, coated with the rubber solution, is passed through a bath which is mutually soluble with the rubber solvent but not with the rubber. The solvent is recovered from the bath by agitating the latter with oil, permitting the mixture to settle and separate, the solvent being taken up by the oil. (John D. Morron, Lakewood, Ohio, assignor to The Mechanical Rubber Co., New York City. United States patent No. 1,312,452.)

#### THE DOMINION OF CANADA.

**PROCESS FOR REGENERATING VULCANIZED RUBBER** by which finely divided rubber is heated in an oil-jacketed vessel, after removal of its contained air by vacuum, to a uniform high temperature. (The Dunlop Co., Limited, assignee of Douglas F. Twiss, both of Birmingham, Warwick, England. Canadian patent No. 192,356.)

**VULCANIZING PROCESS.** An accelerator for the vulcanization of rubber consisting of an alkali metal dissolved in a fluid or readily fusible organic hydroxy-compound other than glycerol or glycol and of predominant hydroxylic character, such as butyl or amyl alcohol or an aromatic hydroxy-compound such as phenol. (The Dunlop Rubber Co., Limited, Westminster, London, assignee of D. F. Twiss, Sutton Coldfield, Warwick, both in England. Canadian patent No. 192,470.)

#### THE UNITED KINGDOM.

**LAMP BLACK** is rendered dustless by mixing with water to form a paste, adding 2/5 per cent of resin oil, and then heating to drive off the water. (E. L. Curbishley, Wood Lea, Albert Road, Cheadle Hulme, Cheshire. British patent No. 127,770.)

**VULCANIZABLE PLASTIC COMPOSITION.** Example of proportions is: 60 parts of reclaimed rubber, 30 parts of leather waste, and 10 parts of ground tire cover. The product may be used as a substitute for leather or for solid tires, floor coverings, engine packing, pump valves, etc. (W. S. Smith, The Drive, Fulham Road, London. British patent No. 127,932.)

**CEMENT** for the repair of apertures in submerged ships consists of five parts by weight of crude rubber dissolved in naphtha; three parts of rosin; two parts of white lead; nine parts of coal pitch; and one-quarter part of shellac. The mixture is used hot to cement metal surfaces and may be applied to cloth to form an adhesive patch. It may be thinned with naphtha and used as a paint. (V. Revello, 28 George street, Cardiff, Glamorganshire. British patent No. 128,755.)

#### GERMANY.

**REGENERATION OF VULCANIZED RUBBER** is effected by heating the material to a high temperature without melting, in a vacuum or in an inert gas. The harmful effect of the air on heated rubber is avoided by rapid cooling by treatment with cold water or solutions of sodium carbonate or alkali. (B. J. F. Varinhorst, The Hague, and J. G. Fol, Delft, Netherlands. German patent No. 302,995. March 19, 1914.)

**PROCESS OF SEPARATING FIBROUS MATERIALS FROM VULCANIZED RUBBER GOODS.** The material is finely divided and stirred for a short time with slightly warm water. The fibers become wet more easily than the rubber and sink, while the rubber particles float and are skimmed off the surface. (W. Golombek, Spandau, German patent No. 303,171, June 24, 1916.)

#### OTHER CHEMICAL PATENTS.

##### THE FRENCH REPUBLIC.

**NO. 490,730.** Process of making a product to replace chonite, bakelite, and other similar substances. Naamloose Vennootschap Nederlandsche Maatschappij tot Exploitate van Optiemiefabrieken.  
**492,140.** Process of manufacturing a substance having caoutchouc as a base. The Goodyear Tire & Rubber Co., Akron, Ohio.

#### LABORATORY APPARATUS.

##### ALUNDUM CRUCIBLES AND THIMBLES.

**ALUNDUM** is an electric furnace product of exceptionally high melting point. It is made of fusing the extremely refractory mineral, bauxite, a natural hydrate of alumina, or a pure aluminum oxide in an electric furnace of the arc type. The refractory material thus produced contains from 92 per cent to practically pure aluminum oxide, depending upon the material fused. Alundum not only has a high melting point, but it is not easily affected by chemicals and has a high heat conductivity.



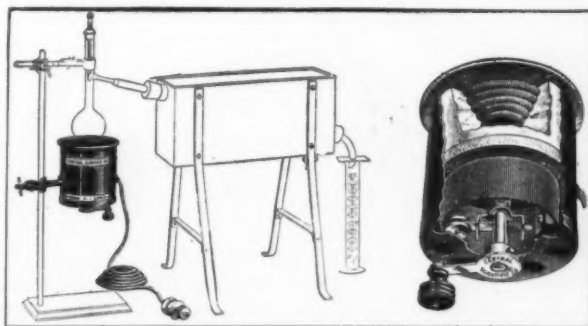
ALUNDUM EXTRACTION APPARATUS.

Alundum is also prepared in various porous forms for laboratory use in filtration and for extracting soaps, fats, food, rubber, etc., by both organic and inorganic solvents, after the arrangement shown in the illustration. (Norton Co., Worcester, Massachusetts.)

##### ELECTRIC HEATER FOR THE DISTILLATION OF GASOLINE.

The instrument shown in the illustration is constructed according to a new idea in electric heaters designed in accordance with suggestion of Dr. E. W. Dean, of the United States Bureau of Mines.

The spiral heating coil of nichrome wire is inserted in a conical spiral groove, turned in a solid block of insulating material. The separate turns of wire are in contact with the insulating block for only a small part of their circumference and, as a result, practically no heat is wasted by absorption in the block. The conical shape of the depression in the block, combined with the high heat-radiating qualities of the material used, causes practically all of the heat to be focused upon the 1¼-inch



ELECTRICAL GASOLINE DISTILLATION HEATER.

opening in the transite top of the heater. As a result the flask containing the gasoline is subjected to an intense heat (sufficient to ignite paper immediately) without the danger of breakage due to contact with a bare flame or a red hot coil. A variable rheostat is mounted in the same case with the heating coil, permitting the temperature to be raised or lowered at will. An enlarged view, and partly in section, is shown in the illustration.

Many additional uses will be found for this device in the laboratory, as it furnishes a rapid and efficient source of concentrated heat which will be found preferable to a gas flame for many operations. (Central Scientific Co., 460 East Ohio street, Chicago, Illinois.)

**DR. A. VAN ROSSEM** will teach the chemistry and technology of rubber in the department of chemical technology in the Technical High School, at Delft, Holland.



## New Machines and Appliances.

### PORTABLE TANK FOR RUBBER CEMENT.

**T**HE ECONOMICAL DISTRIBUTION of rubber cement to the various departments is a question of interest to all manufacturers that use this material.

The cement tank shown in the accompanying illustration is mounted on rubber-tired wheels and may be easily moved by one man who keeps the individual containers filled throughout the entire factory.

The pump measures one quart with a full stroke of the plunger, or any intermediate quantities may be drawn by adjusting the quantity stops, and a discharge register tells the quantity of cement discharged from the pump. A hollow-ball expansion chamber, permits expansion of the liquid in the pump cylinder due to changes in temperature.

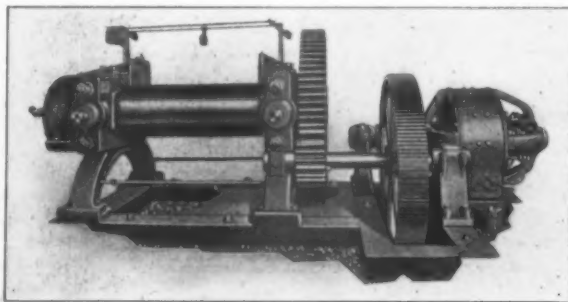


BOWSER RUBBER CEMENT TANK.

The galvanized steel tank is heavily reinforced, all seams being riveted and soldered from the inside and outside to insure against leaking, and all openings are practically air-tight. The top is flanged and bolted to the shell and may easily be removed for cleaning and a hand-operated agitator insures uniform consistency of the rubber solution. (S. F. Bowser Co., Inc., Fort Wayne, Indiana.)

### RUBBER MILL EQUIPPED WITH INDIVIDUAL MOTOR.

Electric drives for mill lines are common in large rubber plants, but this method of drive is not always possible or practical in the smaller rubber mills. Even in the large plants individual



INDIVIDUAL MOTOR-DRIVEN MILL.

mills are required for special work far from the mill-line, for instance, the warming mills in the calender room.

For such installations and the small rubber manufacturer, the individual motor driven mill shown in the accompanying illustration has been designed.

It is substantially constructed with a rigid one-piece bed-plate that supports the mill, drive and motor. The jack-shaft bearing is contained in the housing frame and is of the ring-oiling type. The outboard bearing is also ring-oiled and the reducing gears are machine cut. This type of mill is built with two sizes of rolls; 16 by 42 inches and 18 by 50 inches. (Wm. R. Thropp & Sons Co., Trenton, New Jersey.)

### STACKING TOTE BOXES.

A new form of stacking steel boxes adapted for use with rubber compounding ingredients is here illustrated. It is stiff in construction, has spot-welded embossed runners which present the only line of friction



COMPOUND BOXES.

and remove wear from the bottom in dragging over the floor. Spot-welded guides on the ends guide the boxes into stacking position when they are allowed to drop one into another. These guides in conjunction with the runners also serve to prevent any sidewise shifting of boxes while being trucked.

Box weights do not vary more than two per cent and are furnished

liquid tight if desired. It is claimed for this box that it combines maximum strength with minimum weight. (The New Britain Machine Co., New Britain, Connecticut.)

### BALL-BEARING GRINDER AND POLISHING LATHE.

Improvements are constantly being made in the machinery employed in tire making, for example, the refinement of the buffing stand. The rough-looking, carelessly-built contrivances of cast iron and steel of former years have been replaced by well-designed machines, built of the best materials and according to modern methods of construction.

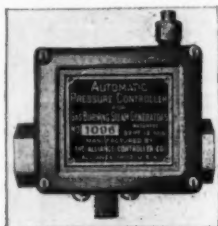
The type here pictured is mounted on a rigid base measuring 20 by 28 inches. The steel spindle revolves in ball-bearings, and measures 1.77 inches in diameter at the bearings and 1.25 inches between the flange, while the length is 45.25 inches over all. It is belt driven from a counter-shaft and weighs 550 pounds net. (The Webster & Perk Tool Co., Springfield, Ohio.)



TIRE-BUFFING STAND.

**AUTOMATIC CONTROLLER FOR GAS HEATED MACHINES.**

This device is primarily intended for repair vulcanizers but it is also designed for use on all other gas-burning steam generators, boilers, etc.



STEAM PRESSURE  
CONTROLLER.

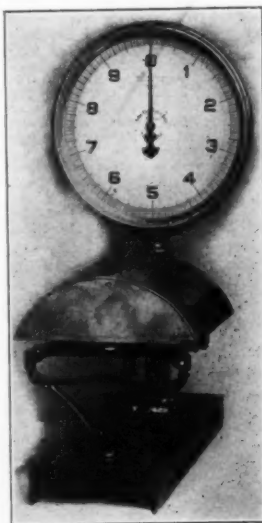
This attachment makes possible a constant and even steam pressure at all times and under all conditions. It allows a full flow of gas to bring the steam pressure to the desired point quickly and then automatically cuts down the flow of gas to the exact amount needed to hold that steam pressure. Once set, it requires no further attention.

(The Alliance Controller Co., Alliance, Ohio.)

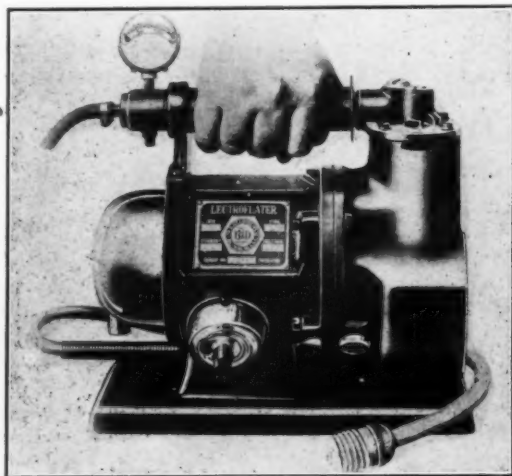
**SCALES FOR AUTO TIRES AND TUBES.**

Tire and tube factory methods include checking up the weights of finished tire carcasses and inner tubes to insure uniformity of product. This is usually done on ordinary scales that have been changed over for this particular purpose.

The accompanying illustration of a scale expressly designed for weighing inner tubes explains itself. For auto tires it is made in two capacities, 10 pounds, and 15 pounds, both weighing by one-half ounces. The dial of these scales is 13 inches in diameter, and fitted with a nickel-plated brass sash and glass measuring 15 inches over all. They are provided with oval-shaped brass platforms for conveniently holding the articles to be weighed. (John Chatillon & Sons, 85-95 Cliff street, New York.



INNER TUBE SCALE.



A PORTABLE TIRE INFLATOR.

**THE HAND-TYPE LECTROFLATOR.**

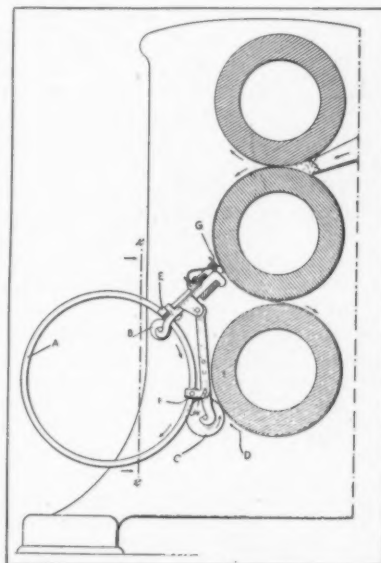
It is not at all surprising that the bulky tire-inflating apparatus so often seen in garages and service stations should be supplanted by a more easily handled device. But it was hardly expected that a light, easily operated and efficient machine of the hand-portable type would ever be serviceable as a practical tire inflator. However, the makers of the machine here shown confidently describe its construction and merits.

The two-piece cast-iron housing encloses the motor, gear-train and the compressor cylinder forming an air-jacket through which air is circulated by an enclosed fan. The piston and connection rods are of aluminum alloy and the piston is fitted with six ground piston rings. The puppet type valves are of brass with ground seats. The internal gearing, cylinder and shaft bearings are grease lubricated by positive systems.

The smallest machine has a capacity of two cubic feet of free air per minute, sufficient to inflate a 34 by 4 tire from flat to 80 pounds in 1 3-4 minutes. (The Black & Decker Manufacturing Co., Baltimore, Maryland.)

**MACHINERY PATENTS.****MACHINE FOR FORMING SOLID TIRES.**

THE MACHINE illustrated is designed to cut and apply to a solid tire base unvulcanized rubber to desired and gradually diminishing widths, placing the rubber on the rim automatically while holding and rotating the rim. The apparatus consists of a frame suspended opposite the lower rolls of a calender on which frame is mounted cutting disks, or knives, the sharp edges of which are held in loose contact with the middle calender roll carrying a thin sheet of unvulcanized rubber, from which they cut a strip of rubber. This strip is simultaneously carried to the wheel rim upon which it is continuously wound until the desired height is obtained.



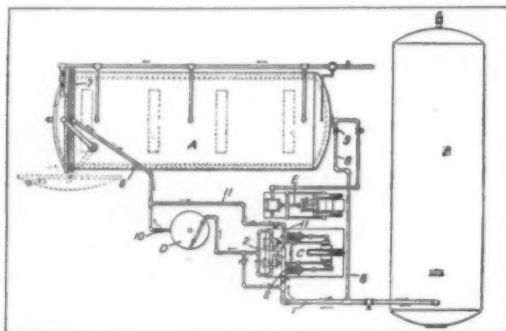
SOLID-TIRE-BUILDING MACHINE.

In operation, a supply of rubber having been prepared, the wheel rim A is placed in position over an off-center supporting roller B, the weight of the metal rim presses firmly against the driving roll C, which in turn presses firmly against the lower calender roll D. The wheel rim is held in place as it revolves by the supporting roller B and side guide rollers E and on the driving roller C by side guide rollers F. A strip of rubber of proper width is started from the middle calender roll and guided over roller C to the wheel rim A. As soon as the rubber is built up to the top of the wheel rim flanges the operator moves an eccentric cam lever, this raises a triangular cam which increases the distance between the rubber cutting knives G, making the next layer of rubber sufficiently wide to extend across the edges of the flanges. Each additional layer of rubber pushes up the triangular cam, permitting a spring to pull the knives closer together and making each layer a little

narrower than its predecessor until the proper amount has been placed on the rim. By setting the cutting knives at an angle the rubber may be cut on a bevel, thus building up the tire on a uniform slant. By using cams of different shape, tires may be built up with sides of various contours. (Robert McClenathen, assignor to Kelly-Springfield Tire Co., New York City, United States patent No. 1,312,491.)

#### PRESSURE-CURE FOOTWEAR VULCANIZER.

In vulcanizing rubber boots the chamber containing them is first freed from air and a vulcanizing medium in the form of a gas (e.g., carbon dioxide) substantially devoid of free oxygen admitted. The chamber is heated by a steam jacket or interior steam coils and the gas is preheated and delivered to the chamber under pressure from a storage tank in which it is kept under pressure.



FOOTWEAR VULCANIZER.

Apparatus for this purpose comprises a chamber A, storage tank B for carbon dioxide, a compression pump C which may also act as a vacuum pump, a pre-heater D and a vacuum pump E. Pipes 8, 1, and 2 serve to pass gas which has entered chamber back to the pump C whence it traverses the preheater again and is thus circulated until the required temperature is reached. It is then sealed in the chamber by valves 9 and 10 and after vulcanizing returned to the tank B by pipes 7, 6 and 11 through the pump C. The compression pump is preferably duplex compression; one which steadily increases the pressure without intermittent reduction. (W. J. Mellersh-Jackson, 28 Southampton Buildings, London. [American Rubber Co., Boston, Massachusetts.] British patent No. 128,852.)

#### OTHER MACHINERY PATENTS.

##### THE UNITED STATES.

- NO. 1,213,026. Tire-stapling machine. A. A. Ewald, Oakfield, Wis.  
 1,312,029. Repair vulcanizer. E. Fetter, Baltimore, Md.  
 1,312,157. Collapsible core for tire molds. C. F. Buente, Avalon, Pa.  
 1,312,364. Repair vulcanizer. C. A. Shaler, Waupun, Wis.  
 1,312,438. Tire mold. H. H. Forrest, Ken, O.  
 1,312,505. Apparatus and method for making tires from pulley band structure. E. Hopkinson, New York City.  
 1,312,627. Mold for tire liners. J. H. Grube, assignor to Airsafe Inner Tire Co., both of Los Angeles, Calif.  
 1,312,878. Apparatus for impregnating fabric. J. E. and Peter D. Thropp, assignors to The De Laski & Thropp Circular Woven Tire Co., all of Trenton, N. J.  
 1,312,954. Machine for making insulated wire. W. E. Cook, New York City.  
 1,312,603. Deflater for inner tubes. R. McClenathen, Cuyahoga Falls, O., assignor to Kelly-Springfield Tire Co., New York City.  
 1,314,029. Gasket-trimming and finishing machine. C. L. Townsend, Norwood, O.  
 1,314,256. Apparatus for connecting and vulcanizing ends of tubes. W. C. Ehrenfeld, Flemington, N. J.  
 1,314,277. Air compressor with cleaning device. A. Loppacker, assignor to Eureka Air Compressor Co., both of Bloomfield, N. J.  
 1,314,344. Mold for vulcanizing hot-water bottles, etc. J. L. Mahoney, New Haven, Conn., assignor to The Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn. (Original application divided.)

#### THE DOMINION OF CANADA.

- 192,217. Tire-bead cementing and reeling machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of George McNeill, Detroit, Mich., U. S. A.  
 192,218. Tire-building machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. J. Steinle, Elmhurst Heights, N. Y., U. S. A.  
 192,219. Tire-bead-wrapping machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of G. McNeill, Detroit, Mich., U. S. A.  
 192,467. Tire-making machinery. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of De Courcy Neal and A. O. Abbott, Jr., both of Detroit, Mich., U. S. A.

#### THE UNITED KINGDOM.

- 127,718. Means for locking together parts of a divided mold for use in molding rubber articles, such as balls, etc. C. H. Gray, India Rubber, Gutta Percha & Telegraph Works Co., Silvertown, London.  
 127,732. Lapping machine for covering wire spirally with insulating strips. C. J. Beaver, Rangemoor, Crescent Road, Hale; J. Stratton, The Lindens, Winton, Road, Bowdon; and E. A. Claremont, Broom Cottage, High Legh—all in Cheshire.  
 127,970. Machine for cutting off marginal portions of pneumatic tires. North Western Rubber Co., Akron, O., U. S. A., and J. Torry, Hardwick, Park Drive, Blumdslands; H. R. Jones, 122 Litherland Road, Bootle; and J. Eastman, 9 Alexandria Mount, Litherland—all in Lancashire.  
 127,990. Special apparatus for making wheel tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 128,004. Mold for tire cover. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 128,114. Apparatus for building tire covers. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 128,684. Apparatus for placing tires in molds, etc. Dunlop Rubber Co., C. Macbeth, and E. Sullivan, 14 Regent street, Westminster.  
 128,717. Machine for washing and masticating rubber. R. W. James, 11 Queen Victoria street, London.  
 128,777. Mold and process for making tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 128,778. Apparatus for shaping and setting tire covers prior to final formation and vulcanization. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

#### THE FRENCH REPUBLIC.

- 490,119. Vulcanizer. J. B. Stroud.  
 490,238. Vulcanizer. W. Reilly.  
 490,276. Improvements in machines for manufacturing rubber heels, soles, or shanks, and other similar articles. Société Wood-Milne, Limited.  
 490,304. Mandrel for the repair of rubber tires for automobile wheels. G. Dugard.  
 491,932. Apparatus for molding and maintaining the shape of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,933. Apparatus for the vulcanization of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,934. Molds for pneumatic tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,935. Molds for the vulcanization of tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,936. Apparatus and process for the manufacture of pneumatic tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,938. Machine for the manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 492,105. Apparatus for tapping *Hevea* trees. J. Sajous.  
 492,250. Machine for mounting pneumatic tires. Michelin & Co.

#### PROCESS PATENTS.

##### THE UNITED STATES.

- NO. 1,312,770. Producing endless elastic bands. A. and H. J. Turner, Leicester, Eng.  
 1,313,286. Making cord bands for tires. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

#### THE UNITED KINGDOM.

- 128,722. Making solid rubber tires. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham.

#### THE FRENCH REPUBLIC.

- 491,931. Manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 491,937. Manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.  
 492,254. Inflating balloons. A. Sauteraud.  
 492,144. Manufacture of galoshes. E. Den Doncker.

#### A NEW WATER GAME.

A new water game, similar to cage ball played on land, was recently introduced in one of the Y. M. C. A. natatoriums in Chicago. It is played with a large rubber ball, thirty inches in diameter, the object being to force it through the opponents' defense to the goal at the end of the tank.



## New Goods and Specialties.

### BLOCK'S SPIRAL SPRING FORCE CUP.

**D**EALERS in kitchen utensils and household furnishings will be glad to know about the force cup shown here, which is suitable for use wherever the ordinary force cup could be used. In addition, it is claimed that this cup is particularly



SPIRAL SPRING FORCE CUP.

efficient because of its special construction. It is made of the best quality of rubber, with a spiral spring of oil-tempered steel inserted in the edge, and a thirty-six-inch wood handle finished to look like mahogany. The handle is recessed so that the clamp that holds on the force cup may secure it tightly. Both the clamp and the spring are sherardized, making them rust-proof. Besides making the force cup stronger and more efficient in use, the spiral spring helps it to maintain its shape. It is claimed that this cup has a force of about fifty-eight pounds, or thirty-six more than the ordinary four-inch one. (Cumming-Forster Corp., 220 South State street, Chicago, Illinois.)

### "REELASTIC" WINDS UP WITH A KEY.

The woman who uses elastic will be glad to know about the kind illustrated below. It winds up on the reel with a key when it is not in use and does away with the inconvenience of having to disentangle it from other articles in the sewing basket before it can be used. The new feature of this key-winding reel for elastic is the slot at the left of the key, which is marked with a scale to show how many yards of elastic are left out of the original twelve. (The American Mills Co. of New York, 395 Broadway, New York City.)



"REELASTIC" GARTER WEBBING.

### NEW STEP-PLATE.

A new type of service step-plate for the running-board of automobiles is made of rubber and fiber composition without metal inserts. The upper illustration of the two shown herewith indicates how the ribs of the tread are formed by a special process in which the long interwoven fiber follows the rib formation.



SINGLE UNIT STEP-PLATE.

It is claimed that this kind of step-plate does not get slippery in wet weather, like one of rubber only, and that the surface does not crumble and break off with continued wear; also that the device will not warp, spread, buckle, or rust, since no metal enters into its construction. (Service Rubber Co., 144 Oneida street, Milwaukee, Wisconsin.)

### TIRE SHOES AND RELINERS FROM PULLED FABRIC.

The vulcanizer and motorist are now being offered tire shoes

and reliners made from high-grade "pulled fabric," etc., derived from specially selected tires originally built from Sea Island fabric and Pará friction. These are buffed, skived, and cut to fit, for the repair man, or painted and cemented ready for use. (The Lowenthal Co., 947 West 20th street, Chicago, Illinois.)

### GOLF AND WEAR "SHIRTHOLDS."

A new device which dealers are finding profitable is called the "Shirthead." It consists of a strip of high-grade rubber four inches long, bearing rubber teeth similar to those of a rubber tooth-brush,



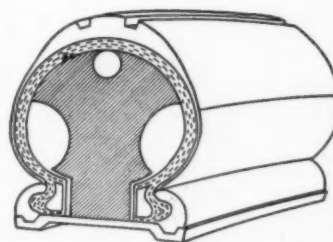
THE "SHIRTHEAD."

but not so long; this strip is attached at each end to a safety pin. A pair of "Shirthead" worn inside the trouser waist-band, directly over the hips, will, it is claimed, hold the shirt down and the trousers up in spite of strenuous action on the part of the wearer, at the same time acting as a cushion for a tight belt so that suspenders may be dispensed with. Being of rubber, the teeth will not injure the finest fabric. A patent has been granted on the invention. (The Shirthead Co., 324-328 Washington street, Green Bay, Wisconsin.)

### THE "TRIPLE AIRLESS"—A NEW TIRE.

Another development of the "airless" tire is illustrated below.

The white spaces at the top and sides of the sectional view indicate shock-absorbing chambers which relieve the tire bridge. This bridge, in turn, is constructed so as to insure a perfect lock, while the beads are of extra heavy construction. The tire is frictioned by a method which is claimed to eliminate fabric separation, and a cushion of special quality is provided at the tread.

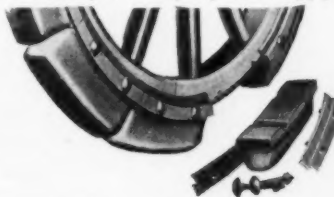


"TRIPLE AIRLESS" TIRE.

(Triple Airless Tire Co., Manorville, Pennsylvania.)

### THE EDWARDS SECTIONAL SOLID CUSHION TIRE.

A tire for trucks has been devised that is made in sections. If one of these sections is injured in any way or wears out, it can be replaced without disturbing the others and without taking the wheel off the truck. The only tools required are a hammer and monkey wrench, or, when applying for the first time, an ordinary brace and bit in addition, for boring dowel holes into the felloe one-half inch in diameter and one-half inch in depth.



NEW SECTIONAL TIRE.

The sections, twelve in number, are made to fit standard S. A. E. wheels and can be applied to touring cars as well as trucks. When used on touring cars, the tires are placed on a light wheel by using a tire band which rests on six small lugs about one-quarter-inch from the wheel-band. (The Edwards Rubber Co., Akron, Ohio.)

**A TOY SEAPLANE TO ASSEMBLE.**

Some manufacturers who had the foresight to see how popular practical toys in line with the interests of the day would be, took advantage of the situation and developed



LAWRENCE NAVAL SEAPLANE.

specialties that have proved to be of more than temporary benefit to dealers who handle them. These include the airplane and the seaplane.

The seaplane shown above is 36 inches long assembled, and is equipped with a pair of 16-inch stream-line, hollow, single-step seaplane floats. The metal parts are aluminum and the wing covering, silk. The motor is a strong band of Pará rubber.

This toy may be purchased, assembled or knocked down. In the latter form it includes 145 separate parts which the ingenious boy will delight to put together with the help of the scale, working, drawing and instruction book which come with the parts. (Lawrence Airplane Model & Supply Co., 569 West Van Buren street, Chicago, Illinois.)

**A WHITE RUBBER COAT.**

Those who desire a raincoat that is different will be sure to admire the one illustrated



SHOWERPROOF RIDING COAT.

here, made of white rubber, trimmed with collar and cuffs of contrasting color and big pearl buttons. The armhole is large, with fitted sleeve, and there are two pockets.

**SHOWERPROOF RIDING COAT.**

For those who ride in all weathers, a showerproof riding coat has been specially designed for comfort and service. In the back is a vent formed by a fan-shaped saddle extension which folds inward, while the front extension shown in the picture permits the coat to fall comfortably over the pommel of the saddle. This coat is made in rubberized silk or gabardine in light or olive tan.

Both the white rubber coat and the showerproof riding coat are furnished by a prominent sporting goods house. (Abercrombie

& Fitch Co., Madison avenue and 45th street, New York City.)

**THE "LYNER TYRE."**

A tire interliner, as its name implies, is constructed of especially strong, rubber-impregnated fabric, vulcanized over an aluminum mold, so that it fits the tire casing snugly without pinching the tube. The outside of the protector is lightly coated with rubber and a heavy layer of rubber cement which vulcanizes itself to the casing, eliminating slipping and possible friction. (Pelletier Rubber Co., Box 322, Cincinnati, Ohio.)

**CLOTHES SPRINKLER.**

The "Even-Spray" clothes sprinkler utilizes the principle of any ordinary shaker with perforated top. In this case, however, the top is made of rubber so that it may be stretched to fit the neck of any bottle, preferably a round one which is easy to grasp.

This sprinkler permits a more uniform and even application of water to the clothes to be sprinkled than can be accomplished by hand. The sprinklers are packed by the two dozen on display cards with easel backs. The cards themselves are packed in strong cartons which protect them from becoming soiled or broken. (The Elyria Specialty Co., Elyria, Ohio.)



"EVEN-SPRAY" SPRINKLER.

**A PRACTICAL RAINCOAT.**

A good-looking, practical raincoat is illustrated at the right of the central picture. It is made of rubberized fabric in changeable color effect, with raglan sleeves and a simple turnover collar. A belt slips under side-straps formed by the extensions of the pocket overlaps and similar straps ornament the cuffs. The coat fastens in double-breasted style, with large buttons. (Holstein, Young & Co., 34 West 27th Street, New York City.)

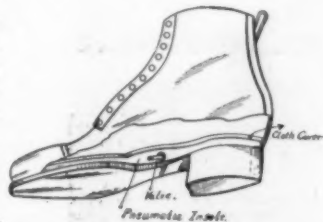


COAT OF WHITE RUBBER.

STYLISH RAINCOAT.

**PNEUMATIC INSOLE.**

A pneumatic insole for shoes has been devised, which takes the form of a thin rubber sack covered with thin, tough cloth and paper. This sack is divided by transverse partitions perforated with small holes so that air can pass from one compartment to the next. A tiny valve is located in the instep, by means of which the insole may be inflated. If desired, a rubber tube with bulb attached may be fastened to the valve, the shoe may be put on and laced up, and the insole then inflated to suit the requirements of the wearer's foot.



PNEUMATIC INSOLE.

Thus a combined insole and arch support is formed, which it is claimed will cure soft corns and otherwise contribute to the comfort of the wearer, since the weight of the body is

distributed evenly all over the sole instead of in certain spots only. This device is patented. (B. A. Spinney, 110 Ewing Apartments, Des Moines, Iowa.)

## The Obituary Record.

### BRITISH COMMERCIAL COMMISSIONER AT WASHINGTON.

**I**N THE PASSING OF SIR RICHARD CRAWFORD, the rubber trade of America loses one who rendered it conspicuous service during the troublous days of the Great War. Indeed had it not been for his fairness, foresight and infinite tact it is doubtful if rubber manufacture could have been continued except under great difficulty. What he did in rubber he also did in textiles and various commodities affected by the war. A very timely appreciation from the pen of A. M. Patterson of the Textile Alliance so well sums up Sir Richard Crawford's important work that we gladly give it in full:

The notices of the death of Sir Richard Crawford, which have appeared in the press on both sides of the Atlantic, have been so perfunctory that a few of his friends desire to make more generous recognition of the quality and importance of his work as Commercial Commissioner at the British Embassy during the War.

The first effect of the war on American commerce was to halt supplies of materials of which the British Empire was the principal or the only source. The extension of the contraband lists to include many articles always before free caused great resentment and aroused bitter criticism of the Government on whose naval and consular representatives fell the burden of enforcing the new rules.

When Sir Richard Crawford arrived in the United States in February, 1915, he found an acute irritation which it was his duty to relieve by the establishment of trade agreements and informal arrangements. They were then tolerated, but later recognized and subsequently in many cases taken over by the United States Government on its entry into the war. That they did not cause a breach was due in a large measure to Sir Richard Crawford. His tact in dealing with our citizens who did not understand and were reluctant to submit to restrictions which they believed our Government should actively resent, as well as his constant insistence on fairness to all and the correction of injustice, even when the aggrieved party had no legal case for redress, was continuing cause for admiration and respect to those behind the scenes. More than once his views placed him in opposition to his own Government's views; on at least two occasions he risked his influence at home, and on one occasion his entire career to carry his point, when he felt his country pledged to a course which others deemed inexpedient.

The same qualities which marked his dealings with the outside world made Sir Richard an ideal man to work with. He gave to his subordinates a full measure of consideration, authority and responsibility, and was rewarded by affectionate and efficient service. With those Americans who were associated with him he established a relationship which invariably became one of confidence and friendship, even though it may have begun on the American side with suspicion or resentment.

In addition to contraband, other subjects of great importance fell to Sir Richard. The supply of oil, finance, loans and arrangements, and the embargo upon the export of munitions which at one time seemed not improbable, were all in his province. In dealing with them he had the full confidence of his Ambassador and was himself in fact the Commercial Ambassador. Even before the United States entered the war his health was broken under so great a strain. Only flexible determination and the care of his wife enabled him to continue as he did for four years without intermission and practically without rest.

When completely broken health followed the death of Sir Cecil Spring-Rice and the end of the war, Sir Richard returned to England in the hope of a speedy recovery which would enable him to return to Washington, for he felt the need of sympathetic and wise management of the financial and commercial readjustments and the reestablishment of competition between the two countries and believed he could and should undertake it. He accepted a proffered post in Egypt only because he felt that he might find in that climate the strength which he could not regain in America. As late as last April he spoke of being able later to return to Washington and of his country's needs there,

as the faithful servant who plans the full measure of service, although it was already plain that even Egypt was beyond his failing powers. In this fidelity he was a worthy representative of that class which has made the British Empire both at home and abroad the unchanging force that it has been for two hundred years, regardless of fluctuations of popular opinion or local politics.

As it turned out in serving his own country Sir Richard as well served the United States. The measure of it is known only to those closely associated with him, because of the manner in which he sank his personality in his mission.

Sir Richard Frederick Crawford, G. C. M. G., K. B. E., was born June 18, 1863. In 1904 he came prominently into public notice as Commissioner of Customs, a post which he held until 1911, when he was made a K. C. M. G. From 1911 until 1914 he was adviser to the Imperial Ottoman Ministry of Finance, and received the Grand Cordon of the Ottoman Order of the Medjidiieh. When Turkey entered the war, however, he barely escaped from Constantinople with his life. On January 19, 1914, he was appointed a minister plenipotentiary in the diplomatic service, honorary rank. He was made Commercial Adviser to the British Embassy at Washington, D. C., November 15, 1914, and became Commercial Commissioner June 1, 1917. Three days later he was made a Knight Commander of the Order of the British Empire.

### A PROMINENT TRENTON RUBBER MAN.

William Hall Servis, treasurer of the Hamilton Rubber Manufacturing Co., Trenton, New Jersey, died on September 19, 1919, at his home in that city after a long illness. He



WILLIAM H. SERVIS.

broke down from nervous prostration last April and was obliged to give up his work. A month ago his condition became worse and he was confined to his room until his death.

Mr. Servis was born in Ringoes, Hunterdon County, New Jersey, January 6, 1855, being the son of Hiram and Sarah Servis. He was educated in the district schools and at a business college and for fourteen years was employed by the Buck Thorn Fence Co.

In 1896 he joined the Hamilton Rubber Co. and in time became its vice-president; in 1906 the Hamilton company bought the Combination Rubber Co. of Bloomfield, New Jersey, and Mr. Servis became president of that subsidiary. The success of the Hamilton Rubber Co. in recent years is attributed to the executive ability and the enterprising and progressive business methods introduced by Mr. Servis.

William H. Servis was a man of broad views, always interested in public questions. He was a member of the old Green Street, now the First Methodist Episcopal Church of which he was a trustee and treasurer. He belonged to Orpens Lodge No. 137, Free and Accepted Masons, of which



he was a Past Master and also to the Trenton branch of the Mystic Shrine. He was a member of the Trenton Country Club and gave much to charity. He leaves his widow, one son, Frank W. Servis, and two sisters.

#### ONE OF KELLY-SPRINGFIELD'S OLDEST EMPLOYEES.

Announcement has been made of the death of H. P. Thompson, district manager for the Kelly-Springfield Tire Co., New York City, for the State of Texas.



H. P. THOMPSON.

Mr. Thompson was born in Texas about 33 years ago, and his entire business career was in that State. Previous to entering business he joined the United States Navy, serving as a gunner during the Spanish-American War, and seeing active service with the fleet at Santiago.

He then entered the employ of the Kelly-Springfield Tire Co. as salesman, working in Texas, under the St. Louis branch. As his business increased Dallas was made a branch, and he was appointed manager. Later, San Antonio and El Paso were made depot points, and he was appointed manager of the Texas district.

He is survived by his widow and mother.

#### PRESIDENT OF THE GOODYEAR RUBBER CO.

Frederick M. Shepherd, Jr., president of the Goodyear Rubber Co., New York City, died at his home in East Orange, New Jersey, September 17, aged 61 years.

Mr. Shepherd was a lineal descendent of Edward Shepherd, who came from England and settled in Cambridge in 1638. The father, Frederick M. Shepherd, was president of the Union India Rubber Co., in the early 'fifties, founder and president of the Goodyear Rubber Co. from 1872 to 1906, and president of the United States Rubber Co. from 1896 to 1902.

The son became connected with his father's enterprises in early life, and was secretary of the Goodyear Rubber Co., and succeeded to the presidency on the retirement of his father, carrying on the business in the same lines which had proven so successful. He also succeeded his father as president of the Orange Water Co., which was founded by the elder Shepherd, and held the same position with the East Orange Safe Deposit and Trust Co., which he was instrumental in establishing.

Mr. Shepherd is survived by his widow and three sons, one of whom, Newell C., is secretary of the Goodyear Rubber Co.

SERGEANT ARTHUR W. HAZELL, OF THE ROYAL WARWICKSHIRE regiment, who had been with the Dunlop Rubber Co., Birmingham, England, for fourteen years, died in August as a result of the after-effects of gas poisoning. He enlisted in 1915.

#### FINCK BARYTES PRODUCTION INCREASES

The Missouri Baryta Co., St. Louis, Missouri, of which C. P. DeLore, president of the J. C. Finck Mineral Milling Co. is president, has purchased approximately 4,500 acres of baryta land in Washington County, Missouri, comprising the second largest baryta producing property in Missouri. The new equipment being installed will double the output immediately and quadruple it within a year.

In connection with this increasing production the J. C. Finck Mineral Milling Co. has bought the complete stock and equipment of the Lambert Cooperage Works, St. Louis, and is moving them to the Fink plant. The Lambert works was one of the largest slack barrel plants in the city and had a capacity of 135 barrels per hour.

#### RUBBER INDUSTRIES ATHLETIC LEAGUE OUTING.

THE first annual outing of the Rubber Industries Athletic League, an organization formed last spring among the employees of the eastern offices of the large rubber companies, came off Saturday, September 27. The steamer *Hendrick Hudson* of the Hudson River Day Line took the R. I. A. L. and friends, to Bear Mountain, where a delightful day was spent.

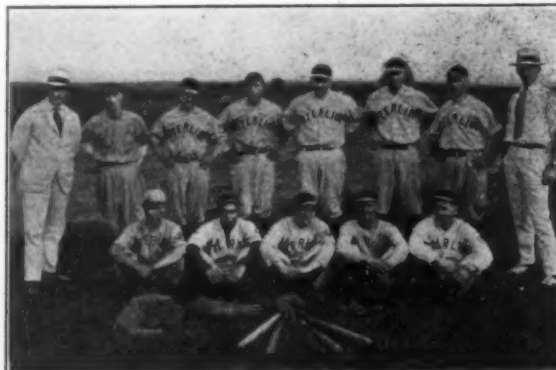
An exciting baseball game was played between the Sterling team, the winners of the R. I. A. L. tournament, and a picked nine from the teams it had defeated during the summer. The athletic games, which were keenly contested, included a 100-yard dash, a 440-yard run, a half-mile relay race, a three-legged race and a 50-yard dash for ladies. The day was thoroughly enjoyed by all who had the good fortune to take part in the excursion.

The first year's baseball competition of the Rubber Industries Athletic League has proved a great success, eight teams having been organized, which played to the close of the series. The number of competing teams will undoubtedly be larger next year.

The season ended on September 20, with the following result:

	Won.	Lost.	Percentage.
Sterling .....	17	2	.894
Goodyear .....	13	5	.722
United States Rubber.....	12	7	.631
Kelly-Springfield .....	12	8	.600
Firestone .....	7	8	.466
Globe .....	5	11	.312
Ajax .....	3	14	.176
Goodrich .....	1	15	.065

The Sterling team, which may be seen in uniform in the accompanying illustration, had to fight hard to establish its superiority and win the silver trophy cup presented by THE INDIA RUBBER WORLD, as well as the pennant presented by the Kelly-Springfield Tire Co. The second prize, the cup presented by



THE STERLING BASE-BALL TEAM, WINNER OF "THE INDIA RUBBER WORLD" TROPHY CUP.

Left to right (standing): Otto Basten (manager of team and vice-president of the Sterling Tire Corp.); J. Messler, W. Thompson, H. Davis, J. B. Rourke (captain), W. Shary, S. Fredericks, and Spencer Welton (President of the Sterling Tire Corporation). Seated, left to right: W. Stoltz (mascot), W. Jackson, J. B. Reynolds, A. Roach and W. White.

Baker, Murray & Imbrie, was won by the Goodyear team after a close struggle with the United States Rubber and Kelly-Springfield teams, the issue being settled only on the last day. The names of the twelve players who made the best individual records, and so won the watch fobs presented by A. G. Spalding & Brothers will appear in the November number.

The officers of the R. I. A. C. for this year are:

President—P. C. Botzenmayer, United States Rubber Co.

Vice-President—H. A. Demarest, The B. F. Goodrich Rubber Co.

Secretary—J. L. Wood, Ajax Rubber Co., Inc.

Treasurer—Bartlett Greene, Sterling Tire Corp.

The companies which so far are represented in the Athletic League are: Globe Rubber Co., Keystone Tire & Rubber Co.,

Kelly-Springfield Tire Co., Miller Rubber Co., Pennsylvania Rubber Co., Sterling Tire Corp., United States Rubber Co., Ajax Rubber Co., Inc., Empire Rubber & Tire Co., Federal Rubber Co., Firestone Tire & Rubber Co., The Goodyear Tire & Rubber Co., The B. F. Goodrich Rubber Co.

### THE EDITOR'S BOOK TABLE.

DETERMINATION OF FREE CARBON IN RUBBER GOODS. BY A. H. Smith and S. W. Epstein, assistant chemists, has been published as Technologic Paper No. 136 of the Bureau of Standards.

THE details of the method described in the above pamphlet were published in THE INDIA RUBBER WORLD, January 1, 1919, page 197.

"STUBBS BUYERS' DIRECTORY FOR THE WHOLESALE DRUG, Chemical and Allied Trades"; 388 pages, 6 by 9 inches. Alfred Stubbs, New York.

The 1919 edition of this standard work is "a classified list of manufacturers, importers and first hand wholesalers" and lists such materials as anilines, chemicals, dyestuffs, drugs, gums, oils, essential oils, and crude and raw materials, for manufactures in important industrial chemical lines, including rubber manufacturers.

DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA. By A. L. Dyke, E.E. Tenth edition. A. L. Dyke, St. Louis, Missouri. (Cloth, large octavo, 940 pages, profusely illustrated.)

The tenth edition of this voluminous work on the construction, operation and repair of automotive vehicles and gasoline engines of all sorts has made its appearance thoroughly brought up to date and containing, in addition to the sections on automobiles, trucks and motorcycles, much new material on tractors and airplanes. Two sections, comprising 27 pages, are devoted to tires and tire accessories of all sorts, the use, care and repair of tires, rims, air pumps, compressors, etc. Hundreds of half-tones, diagrams, charts, inserts, a comprehensive index and numerous supplements illustrate the text, and altogether the volume provides a remarkable compendium of ready reference for the motorist, cyclist and aviator.

### NEW TRADE PUBLICATIONS.

"PNEUMATIC TIRE VALVE WRINKLES" is the title of a 43-page cloth-bound book, vest-pocket size, published by A. Schrader's Son, Inc., Brooklyn, New York. Although compiled primarily for the use of the various branches of the United States Army and Navy, it is of value to every motorist and cyclist, acquainting him in a concise manner with all that it is necessary for him to know about tire valves, various allied accessories and their care, proper tire inflation, ascertaining air pressure, etc.

\* \* \*

"THE STORY OF THE TIRE" is the title of a very interesting and instructive 67-page illustrated booklet published for distribution by The Goodyear Tire & Rubber Co. Beginning with the many uses of rubber and the discovery of vulcanization by Charles Goodyear, it recounts the growth of the Goodyear business, describes the great manufacturing plant at Akron, Ohio, the rubber plantations in Sumatra, the cotton plantations in Arizona and the fabric mills in Connecticut. How rubber is grown and prepared for market, and how it is used in the manufacture of tires of various sorts are concisely detailed. Altogether it is an exceptional piece of trade publicity.

\* \* \*

BLACK & DECKER, BALTIMORE, MARYLAND, HAVE ISSUED A handsome 32-page catalog of their Lectroflaters, electric air compressors, portable electric drills and electric valve grinders. The Lectroflaters are made in numerous forms for private and garage use, ranging from small hand and wall devices to stationary and portable tank outfits. The air compressors are for pneumatic truck-tire inflation and operating pneumatic tools, etc.

DEPARTMENT OF COMMERCE BULLETINS, MISCELLANEOUS SERIES No. 81. "Selling in Foreign Markets," by Guy Edward Snider. In a volume of 637 pages the Bureau of Foreign and Domestic Commerce and the Federal Board for Vocational Education have combined to provide the American business world with information that may enable it to enter foreign markets with some chances for success. The information covers export sales problems, the export middleman, traveling salesmen, correspondence, catalogs, and advertising. There is a chapter on credits and one on delivery, packing, etc., making the book as a whole well worth reading by all who are planning to do business with foreigners.

\* \* \*

The "Bulletin de l'Association des Planteurs de Caoutchouc," published at Antwerp, Belgium, comes to life again after a silence of five years during the German invasion. It announces that it must double its price and that it will deal with all tropical products as well as with rubber. These products will be taken into its rubber museum also, which luckily escaped the notice of the invaders and is nearly intact. Among other interesting articles, some of which are finely illustrated, is one on the rules of the Antwerp rubber futures market. The artistic colored cover shows a Malayan tapping a rubber tree.

\* \* \*

"THE TRANS-PACIFIC," A FINANCIAL AND ECONOMIC MAGAZINE of international service, published at Tokio, Japan, is a new publication which has just come to hand. It is a large, well-printed magazine having for its object to bring into closer business relations the activities and enterprises of the United States with those of the Far East and Australasia. A number of prominent industries of China, Japan, the Philippines, Australia, and Siberia are described, with ample illustrations in this number.

The editorial staff and contributors include several prominent business writers and officials in the Eastern countries. The main portion of the magazine is printed in English, but there is a Japanese section in charge of an editor of an influential magazine in Japan, and a Chinese section edited by a student of economic affairs in China and other Far Eastern countries. The magazine starts out with the promise of being both interesting and useful to American houses catering to foreign trade.

\* \* \*

A NEW TIRE JOURNAL. UNDER THE EXCELLENT NAME, "Tires and Accessories" (Edward Lyman Bell, Inc., 373 Fourth avenue, New York City), a new journal makes its bow to the trade. It is evident from its leading articles, its wealth of trade news and its excellently arranged Table of Comparative Tire and Tube Prices that it aims to interest and assist distributors. The field is big and fertile and the initial number one of much promise. May success and its accessories attend it.

### MEETING OF THE SCRAP RUBBER DIVISION OF THE NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The meeting of the Scrap Rubber Division of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, on September 16. David Feinberg presided in the absence of Chairman Muehlstein.

A committee appointed to confer with the Rubber Reclaimers' Division of the Rubber Association of America with reference to the payment of interest on overdue accounts made its report. It has sent a letter to the Rubber Reclaimers' Division proposing that 6 per cent interest be allowed for any overdue period.

CHARLES E. MILLER, ANDERSON RUBBER WORKS, ANDERSON, Indiana, is building a three-story and basement addition of brick and concrete, 108 by 108 feet, to be used largely in the manufacture of tires, vulcanizers and other rubber-working machinery.

## PENNSYLVANIA RUBBER CO. BUILDING HOMES.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has recently purchased a tract of approximately 120 acres adjacent to its plant, and is plotting it out in streets now being graded, dividing it into about 600 house lots, on which it is erecting houses of modern design and construction. Twelve of these houses are already built, and 33 are now in course of construction.



HOMES FOR PENNSYLVANIA RUBBER CO.'S WORKMEN.

tion, to be completed next month. They are attractive and commodious, of stucco and brick, with up-to-date arrangements for lighting and heating. They are offered to the employees on liberal terms and are being taken so fast that the company will continue the erection of still more homes to solve the problem of housing its employees.

## NEW INCORPORATIONS.

Acme Tire & Rubber Co., August 5 (Wisconsin), \$100,000. O. M. and J. M. Carter; A. Loell, Sr. Principal office, Milwaukee, Wisconsin. To manufacture and repair tires and tubes.

Acorn Tire & Rubber Co., Inc., August 25 (Delaware), \$1,000,000. M. C. Kelly; S. L. Mackey; J. D. Frock—all of Wilmington, Delaware. Delaware agent, Delaware Charter Guarantee & Trust Co., Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber and gutta percha.

Admiral Tire & Rubber Co., Inc., September 12 (New York), \$2,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires, etc.

Aero Cushion Inner Tire & Rubber Co., May 17 (Michigan), \$500,000. B. A. Herrington, president; E. L. Sherbondy, vice-president; J. J. O'Shanessy, secretary; C. E. Judson, treasurer; Dr. E. T. Grovenor. Principal office, 909 Ford Building, Detroit, Michigan. To manufacture and sell Aero cushion inner tire, automobile casing, bicycle tires, rubber heels, rubber cushions, rubber bumpers and other commercial rubber products.

All-In-One Auto & Tire Co., September 8 (Delaware), authorized capital 1,000 shares without nominal or par value. W. F. O'Keefe; G. G. Steigler; J. H. Dowdell—all of Wilmington, Delaware. Delaware agent, Corporation Co. of Delaware, 901 Market street, Wilmington, Delaware. To manufacture and deal in automobile tires and tubes.

Canion Rim Co., August 15 (Maryland), capital stock of 500 shares preferred stock at \$10 per share and 1,000 shares common stock without any par value. W. R. Gunn; L. Stille; E. E. Johnson—all of 563 Calvert Building, Baltimore, Maryland. Principal office, 563 Calvert Building, Baltimore, Maryland. To manufacture, buy, sell and deal in rims to be used on automobile wheels and other vehicles.

Compression Tube & Tire Corp., August 29 (Delaware), \$600,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires and inner tubes.

Dilator Syringe Foreign Rights Corp., September 4 (Delaware), authorized capital, 10,000 shares without nominal or par value. A. W. Britton; F. L. Nieser; W. R. Randall—all of 65 Cedar street, New York City. Delaware agent, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture and deal in domestic and foreign patents in and for syringes and all other articles of a similar nature.

F. M. Tire & Repair Co., Inc., September 13 (New York), \$15,000. W. D. McLaughlin, 335 Virginia street; E. H. Fahmer, 149 Rodney avenue; E. W. Studt, 299 Highland avenue—all of Buffalo, New York. Principal office, Buffalo, New York. To deal in tires.

Galion Rubber Co., The, May 5 (Ohio), \$25,000. J. N. Smeltzer, president and treasurer; E. F. De La Croix, vice-president; J. Kostler, factory manager. Principal office, 20 East 17th street, New York City. Factory, Galion, Ohio. To manufacture rubber drug sundries and novelties.

Goodyear Tire & Rubber Co. of California, July 11 (California), \$20,000,000. H. Chandler; J. C. Drake; L. A. Phillips; J. F. Sartori. Principal office, Los Angeles, California. To manufacture tires, etc.

Hibbs Rubber Co., The, July 14 (Texas), \$100,000. G. H. Calvin, Fort Worth; R. L. Davidson, Greenville; T. B. King, Houston—all of Texas. Principal office, Fort Worth, Texas. To manufacture auto tires, tubes and machinery.

Hirsch & Co., Inc., Adolph, August 18 (New York), \$2,000,000. A. Hirsch, president, I. H. Hirsch, vice-president and treasurer, A. A. Glass, secretary. Principal office, 53 Park Row, New York City. To import rubber and other products from Brazil.

Independent Tire Co., August 4 (Kentucky), \$35,000. G. R. Davis; J. G. Kehkopf, Sr.; A. G. Oakley; E. J. Paxton—all of Paducah, Kentucky. Principal office, Paducah, Kentucky. To manufacture tires and tubes.

K. & S. Rubber Products Co., Inc., August 12 (New York), \$5,000. L. C. and A. J. Wilckens, both of 6939 Ridge Boulevard; C. J. Wolters, 428 Ovington avenue—all of Brooklyn, New York. To deal in rubber goods.

Klaus-Morr Battery & Tire Co., Inc., September 6 (New York), \$3,000. E. S. Klausner, 2194 Seventh avenue, New York City; L. A. Morrison, 17 Vista avenue; J. S. Neidich, 247 South Broadway—both of Yonkers, New York. To deal in tires.

London Rubber Co., August 27 (Pennsylvania), \$100,000. A. L. and H. London; A. C. Teplitz—all of Pittsburgh, Pennsylvania. Principal office, 906 Forbes street, Pittsburgh, Pennsylvania. To manufacture rubber cloths, raincoats and inner tubes.

Mendenhall Resilient Wheel Mfg. Co., August 25 (Delaware), \$3,000,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in vehicle wheels and resilient, elastic and spring wheels of all kinds.

Middletown Rubber Co., Inc., September 6 (New York), \$1,000,000. J. T. MacDonald; M. J. Friedman—both of 280 Broadway, New York City; S. A. Thompson, Middletown, New York. To manufacture rubber goods and druggists' sundries.

Norwalk Tire Sales Co., Inc., September 11 (New York), \$10,000. R. J. Gleichauf; L. A. Arentz; F. P. Surgenor—all of 174 State street, Albany, New York. Principal office, Albany, New York. To deal in tires.

Nu-Tred Tire & Rubber Co., August 6 (New York), \$100,000. C. F. Hughes, 61 Broadway; C. G. Wheeler, 26 Liberty street; F. G. Ricker, 150 Nassau street—all of New York City. To deal in and repair tires.

President Suspender Co., The, August 15 (Massachusetts), \$400,000. J. M. Foster; F. C. Gray; J. F. Rollins—all of 60 State street, Boston, Massachusetts. Principal office, Shirley, Massachusetts. To manufacture and deal in suspenders, garters, webbing, etc.

Puritan Rubber Manufacturing Co., August 21 (New Jersey), \$250,000. F. Berenstein, Chelsea; W. Berenstein, Jamaica Plain; M. Marcus Stoughton—all of Massachusetts; T. Gordon, Windsor Hotel, Trenton, New Jersey. Principal office, foot of Perrine avenue, Trenton, New Jersey. Agent in charge, T. Gordon. To manufacture, produce, buy, sell, export, import and generally deal in rubber and gutta percha.

Rubber Products Ltd., February 12 (Canada), \$50,000. H. J. Haslett, president and vice-president; W. H. Coste, managing director; A. E. Salisbury, secretary and treasurer; H. H. Clarke, director. Principal office, 105 Winch Building, Vancouver, B. C., Canada. To manufacture rubber goods.

Rubber Securities Co., July 23 (New York), \$10,000. J. Traphagen; F. J. Lumsden; P. F. Lorzer—all of 149 Broadway, New York City. To deal in rubber securities, etc.

Simpson & Wren, Inc., September 9 (New York), \$2,500. J. P. Simpson, 796 East 4th street, Brooklyn, New York; C. F. Wren, 92 Morning-side avenue, New York City; W. H. O'Neill, Weehawken, New Jersey. Principal office, Rockville Centre, New York. To manufacture tires, etc.

Sinclair Rubber Co., Inc., September 9 (New York), \$25,000. C. M. Pyle, 106 East 85th street; I. Solomon, 616 West 207th street; E. P. Brown, 152 East 90th street—all of New York City. To deal in tires.

States Tire & Service Co., August 28 (Delaware), \$10,000. R. E. Nolan, 224 Railroad avenue; J. T. Hanlon, 462 Railroad avenue; A. Brown, 1417 Pittston avenue—all of Scranton, Pennsylvania. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To repair automobiles, automobile tires, and to sell automobile supplies, parts and accessories.

Swaney & Blanchard, Inc., September 19 (New York), \$25,000. C. R. and D. P. Swaney, both of Westfield, New Jersey; G. A. Blanchard, 790 Riverside Drive, New York City. To manufacture tires and rubber goods.

Welfare Tire & Rubber Co., Inc., August 27 (New York), \$5,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

## MOTOR ACCESSORY MANUFACTURERS' CONVENTION.

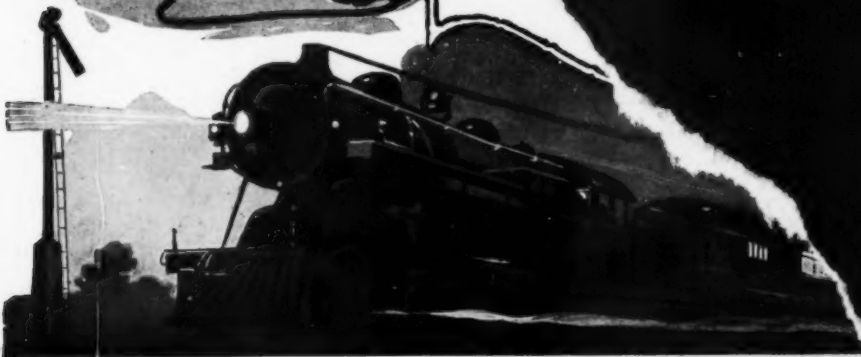
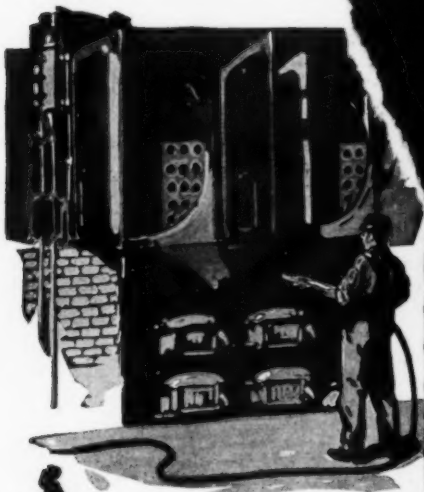
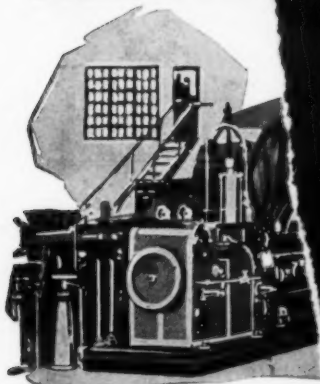
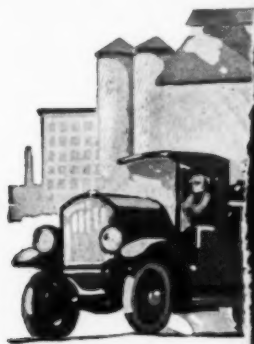
Sane optimism was the keynote of the third annual credit convention of the Motor and Accessory Manufacturers' Association at the Hotel Lafayette, Buffalo, New York, September 11 and 12. This attitude was almost unanimously reflected by the attendance of approximately 150 representative executives of the industry, including credit managers and general officers of leading automotive equipment companies throughout the country.

Although the two-day business sessions were devoted primarily to credit subjects, general conditions in the business world, and particularly the automotive industry, were discussed from all angles.

H. A. Tongue, credit manager of the Firestone Tire & Rubber Co., Akron, Ohio, was among the several speakers who discussed in great detail the broad and far-reaching usefulness of the association's credit department. Other rubber men in attendance were W. O. Rutherford, vice-president of The B. F. Goodrich Co., Akron, Ohio, also C. B. Reynolds, V. I. Montenyohl, W. I. Fornof, and E. S. Sargeant of the Goodrich company; W. D. Skinner, Republic Rubber Co., Youngstown, Ohio; N. S. Conover, Empire Rubber & Tire Co., Trenton, New Jersey; J. A. Lyons, Kelly-Springfield Tire Co., New York City; J. M. Tait, Federal Rubber Co., Cudahy, Wisconsin; W. B. Keiser, The Fisk Rubber Co., Chicopee Falls, Massachusetts; and G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.



OCTOBER 1, 1919.]



[OCTOBER 1, 1919.]

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...and experience we know that we can please you.

**IRON GEAR & ENGINEERING Co.**  
COR. SOUTH AND HIGH STS.  
AKRON, OHIO, U.S.A.



## News of the American Rubber Industry.

### DIVIDENDS.

**T**HE Ajax Rubber Co., Inc., New York City, has declared a quarterly dividend of \$1.50, which was payable September 15 on stock of record August 30, 1919.

The Apsley Rubber Co., Hudson, Massachusetts, has declared its semi-annual dividend of three and one-half per cent, payable October 1 on common stock of record September 30, 1919.

The American Chicle Co., New York City, has declared its quarterly dividend of one and one-half per cent, payable October 1 on preferred stock of record September 21, 1919.

The Firestone Tire & Rubber Co., Akron, Ohio, has declared its regular quarterly dividend of one and one-half per cent, payable September 20 on common stock of record September 21, 1919.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of two per cent on stock of record September 15, payable October 15, 1919.

Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, has declared its quarterly dividend of one and one-half per cent payable September 15 on stock of record August 3, 1919.

The B. F. Goodrich Co., Akron, Ohio, has declared its quarterly dividend of \$1 a share, payable November 15 on common stock of record November 5, 1919.

The Kelly-Springfield Tire Co., New York City, has declared its quarterly dividend of \$1.50 per share, payable October 1 on its six per cent preferred stock of record September 15, 1919.

The Keystone Tire & Rubber Co., New York City, has declared a stock dividend of fifteen per cent, payable September 15 on stock of record September 2, 1919.

The Pennsylvania Rubber Co., East Pittsburgh, Pennsylvania, has declared its regular quarterly dividend of  $1\frac{3}{4}$  per cent on preferred stock and  $1\frac{1}{2}$  per cent on common stock, payable September 30 on stock of record September 15, 1919.

The Plymouth Rubber Co., Canton, Massachusetts, declared its quarterly dividend of \$1.75 a share, payable September 2, on preferred stock of record August 5, 1919.

The Portage Rubber Co., Akron, Ohio, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 20, 1919.

The Tyer Rubber Co., Andover, Massachusetts, declared its quarterly dividend of \$1.50 per share, payable August 15, 1919, on preferred stock.

The United Shoe Machinery Corp., Boston, Massachusetts, has declared quarterly dividends of \$1 a share on common stock and  $37\frac{1}{2}$  cents a share on preferred stock, payable October 4, on stock of record September 16, 1919.

### FINANCIAL NOTES.

H. S. Firestone, president of the Firestone Tire & Rubber Co., in his annual address to the directors of the company on September 5, 1919, explained why the capitalization has been raised to \$75,000,000. Said he:

It is less than three years ago that we increased our preferred stock from \$1,000,000 to \$10,000,000. At that time we had no idea of ever using more than \$5,000,000 of that preferred issue, and with that experience in mind and not knowing what the future might bring forth, we decided to make our preferred capital stock sufficiently large so that we could without expense and complications issue more at any time, and therefore it seemed advisable to raise from \$10,000,000 to \$50,000,000. It is necessary to have half as much common stock as preferred, and therefore it was necessary to increase the common stock to \$25,000,000. We do not intend to make any issue of common stock at this time, and when we do sell

it we hope that it may be possible to offer the common stock to our employees.

The August sales of the Firestone Tire & Rubber Co., amounted to \$10,000,000. The entire sales of the company in 1911 were only \$7,462,000. In other words, in the single month of August the company billed out 33 per cent. more goods than for the full year 1911. For the full year to October 31 next, Firestone will easily do \$90,000,000 of business and for the following fiscal year, making allowance for the effect of the expansion program, gross should considerably overtop the \$100,000,000 mark.

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With a turnover in excess of \$5,000,000, The Fisk Rubber Co. had in August the biggest month in its history. Its subsidiary, Federal Rubber, also reached a new sales mark of \$1,500,000. The Fisk Rubber system therefore did a total business last month of \$6,500,000 or at the annual rate of \$78,000,000. In this connection it is interesting to note that actual sales of the parent company alone last year were but \$36,000,000. The operating profits of both companies last month were close to \$1,000,000, which charge-offs may reduce to approximately \$800,000. The Fisk earning power has more than kept pace all year with sales expansion and has now reached the point where it is forcing upon directors the necessity of considering common dividends.

\* \* \*

The Republic Rubber Co.'s gross sales for September which are expected to exceed \$2,000,000, are running at a rate greater than at any other time in the history of the company. Indebtedness which falls due on October 1, has been anticipated with the result that the company's statement as of that date will for the first time in many years show current assets twice all current liabilities.

\* \* \*

With an increase of approximately 56 per cent in sales volume for the first seven months in 1919, as compared with the same period in 1918, The Miller Rubber Co. shows every indication of breaking all of its previous records at the end of this year. The company did approximately \$16,000,000 business in 1918, and a \$23,000,000 figure was set for 1919. From present indications, the latter mark will be passed easily.

An \$800,000 increase in Miller common capital stock has been authorized. Stockholders may subscribe to new stock at \$100 par on a basis of one-fifth of their holdings. Miller common has been selling at better than \$200 for several months.

\* \* \*

United States Rubber stockholders have ratified the plan calling for increase in capital from \$70,000,000 first preferred and \$40,000,000 common to \$100,000,000 first preferred and \$200,000,000 common. Out of 630,221 shares preferred outstanding, 440,026 voted for the plan and out of 360,000 shares common, 309,372 voted in favor.

The committee on securities of the Stock Exchange has ruled that transactions in common stock of United States Rubber Co. on September 12 shall be ex-rights unless made specifically for cash. Rights may be dealt in on and after September 11.

\* \* \*

The capitalization of the Nebraska Tire & Rubber Co., Omaha, Nebraska, is \$500,000 of which \$300,000 is preferred, guaranteed 7 per cent. dividends, and \$200,000 common. No common stock has been offered for sale.



The balance sheet of the Ajax Rubber Co., Inc., June 30, 1919, compared with that of 1918, follows:

ASSETS.			
	1919.	1918.	
Cash .....	\$761,365	\$581,040	
Bills receivable .....	58,814	58,814	
Liberty bonds, etc. ....	234,923	183,023	
Accounts and notes receivable .....	4,877,150	4,979,223	
Deferred assets .....	100,175	220,544	
Inventories .....	6,539,780	5,126,638	
Good will .....	1,874,875	1,874,874	
Investment account .....	2,573	13,647	
Plant, equipment, etc. ....	2,223,184	2,510,457	
Total .....	\$16,614,026	\$15,548,260	
LIABILITIES.			
	1919.	1918.	
Capital stock .....	\$8,200,000	\$7,100,000	
Accounts payable .....	1,697,721	1,267,989	
Notes and loans payable .....	2,900,000		
Bills payable .....		4,015,000	
Reserves .....	1,285,894	862,822	
Surplus .....	2,530,411	2,302,449	
Total .....	\$16,614,026	\$15,548,260	

The following comparative report is for six months ended June 30, 1919:

	1919.	1918.	Increase.	Decrease.
Net earnings .....	\$1,886,730	\$1,959,608		\$72,878
Dividends .....	488,528	426,000	\$63,528	
Surplus .....	1,398,202	1,533,608		135,406

The following table shows the authorized capitalization of six of the large rubber companies on January 1, 1918, present authorized capitalization and amount of increase:

	Authorized Capital Jan. 1, 1918.	Present Authorized Capitalization.	Increase.
United States Rubber .....	\$120,000,000	\$300,000,000	\$180,000,000
Goodrich .....	84,600,000	109,600,000	25,000,000
Kelly-Springfield .....	13,900,300	20,900,300	7,000,000
Firestone .....	15,000,000	75,000,000	60,000,000
Fisk .....	39,500,000	42,000,000	2,500,000
Ajax .....	*7,100,000	*9,900,000	2,800,000

\* Amount issued. Authorized capitalization of \$10,000,000 unchanged.

#### RUBBER COMPANY SHARE QUOTATIONS.

The following rubber stock quotations on September 22, 1919, are furnished by John Burnham & Co., 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co., Inc. ....	88	89
Brunswick-Balke-Collender Co., preferred. ....	103	...
du Pont de Nemours & Co., E. I., common. ....	314	319
Firestone Tire & Rubber, common. ....	177	182
Firestone Tire & Rubber, preferred. ....	99½	101½
Fisk Rubber Co., The, common. ....	43½	44½
Fisk Rubber Co., The (new), 1st preferred. ....	90	101
Fisk Rubber Co., The, 2nd preferred. ....	170	190
Goodrich Co., The B. F., common. ....	77	78
Goodrich Co., The B. F., preferred. ....	103½	104½
Goodyear Tire & Rubber Co., The, common. ....	380	390
Goodyear Tire & Rubber Co., The, 1st preferred. ....	106½	108½
Goodyear Tire & Rubber Co., The, 2nd preferred. ....	107	109
Portage Rubber Co., The, common. ....	144	148
Kelly-Springfield Tire Co., 1st preferred. ....	95	97
Lee Tire & Rubber Co. ....	29½	30½
Marathon Tire & Rubber Co. ....	...	85
Miller Rubber Co., The, common. ....	190	200
Miller Rubber Co., The, preferred. ....	103	106
Rubber Products Co., The, common. ....	138	143
Portage Rubber Co., The, common. ....	144	148
Swinehart Tire & Rubber Co. ....	90	95
United States Rubber Co., common. ....	112	113
United States Rubber Co., preferred. ....	116½	117½

#### A FEW TIRE, AUTOMOBILE AND ROAD FACTS.

It is estimated that there were 7,000,000 automobiles in the world on January 1, 1919, and by actual count 6,146,677 of these, or about 87 per cent were in the United States—enough, if loaded to capacity, to give half the population of the country a ride at one time. This means that of some 38,500,000 tires now in constant use, about 34,000,000 are to be found in this country. Each of these six million odd cars, when operated on unimproved roads, costs twice as much for tire maintenance as when operated on surfaced roads, and there are approximately eight times as many miles of unimproved as of improved public roads in the United States. Of a total mileage of 2,457,334 only 296,290 miles are surfaced. The Department of Agriculture anticipates that expenditures for road construction will

reach \$500,000,000 this year. Most states are planning continuous systems of connecting highways, and Congress has made an extra appropriation of \$209,000,000 to meet the Federal part of the program. All of which means that average tire mileage is going to increase appreciably. Automobile men predict that the first of next year will see more cars in America than there were in the whole world the first of this year, so that the business of tire manufacture must continue to grow in order to keep pace with the increasing demand.

#### TRADE NOTES.

The Atlantic Rubber Manufacturing Corp., sales agent for Traun Rubber Co., 239 Fourth avenue, New York City, has increased its capital stock from \$15,000 to \$300,000.

The Traveler Rubber Co. of Bethlehem, U. S. A., 819 North Broad street, Philadelphia, Pennsylvania, has awarded the contract for its one-story plant, 91 by 333 feet, to be built in Lower Saucon Township, near Bethlehem, Pennsylvania, at an estimated cost of \$180,000, including equipment.

The Smith Chemical & Color Co., Inc., which was formed recently, will carry a general line of standard dry pigment colors,

chemicals and fillers for the rubber trade. Casper Smith, whose portrait is shown herewith, was formerly connected with the Katzenbach & Bullock Co. as western manager and more recently as director of sales, is the president of the new company, and will personally supervise its business policy. The office of the new concern is located at 116 Nassau street, New York City.



CASPER SMITH.

The Beacon Tire Co., Beacon, New York, will build an addition to its factory to meet the increasing demand for its products.

The Plymouth Rubber Co., Canton, Massachusetts, has opened an office in the Everett Building, 45 East 17th street, New York City, in charge of E. J. Hooper. Mr. Hooper has been with the company for the last twelve years.

The Rebuilt Tire Co., Inc., 910-916 Second avenue, Long Island City, New York (see New Incorporations, THE INDIA RUBBER WORLD, September 1, 1919), will rebuild and retread tires and make pulled reliners for the trade. Charles D. Nolan is president; Charles F. Nolan, vice-president; E. L. Blessington, secretary, and Erich Gollubier, treasurer.

The Alling Rubber Co., 1126 Main street, Bridgeport, Connecticut, is building an extension to its store, to cost about \$25,000. Its premises will be nearly 200 feet deep when the work is completed, with fronts on both Main and Middle streets.

The Goodyear Cotton Mills, Inc., Killingly, Connecticut, are completing the building now being erected for a restaurant for employees. The structure is one story in height, 50 by 100 feet, of brick, and will accommodate between 175 and 200 people on the cafeteria plan, by which it will be operated.

The Franklin Soapstone Products Corp., which was incorporated about four years ago to work the deposits of talc in and around Danville and Saltville, Virginia, has recently completed its plant, and has a present capacity of 100 tons daily, but when further machinery now on hand is installed will increase its output to 150 tons per ten-hour day. The talc or soapstone is of a soft, velvety texture, and there is some of a blue, compact nature. The company proposes to pack its finer quality in small cartons for dusting powders for the tire trade.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" AND "RUBBER MACHINERY," by Henry C. Pearson, should be in the library of every progressive rubber man.

## PERSONAL MENTION.

H. L. McClaren, formerly president and general manager of the Ajax Rubber Co., Inc., New York City, and the Racine Rubber Co., Racine, Wisconsin, has divested himself of all other



H. L. McCLAREN.

interests and purchased a substantial holding in the J. & D. Tire Co., Charlotte, North Carolina, of which he was recently elected president and active general manager, succeeding William F. Smith, who resigned in his favor. Additional equipment is to be installed to allow increased production, and additions to the plant itself are to be built. In addition to its present product, the company is planning to manufacture cord tires and will

install special equipment for this purpose. It is hoped that the production of these can be started in the autumn.

A. J. Sobien, formerly secretary and treasurer of The Anchor Rubber Co., Barberton, Ohio, has resigned and become associated as a director with the newly organized Virginian Rubber Co. at Charleston, West Virginia.

P. A. Doyle, formerly general sales manager for the Ten Broeck Tyre Co., Louisville, Kentucky, has recently resigned and accepted the position of manager of the central district of the International India Rubber Corp., South Bend, Indiana, with headquarters at Kansas City, Missouri.

Harry M. Giles has been appointed general superintendent of the South Philadelphia Works of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. He succeeds the late Oscar Otto, killed in an automobile accident in August. For a number of years Mr. Giles has been superintendent of marine erection for the company.

E. T. Peterson, formerly district sales manager for the Commercial Car Unit Co., Philadelphia, Pennsylvania, has been appointed manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, with headquarters at Buffalo, New York.

R. B. Pierce has been promoted to the position of district manager of the Kelly-Springfield Tire Co., with headquarters at 4600 Prospect avenue, Cleveland, the office of the company's Cleveland branch.

Alf P. Fischley has been appointed manager of the Kelly-Springfield Tire Co., 4600 Prospect avenue, Cleveland, succeeding R. B. Pierce.

C. O. Brandes has been appointed export manager for The Ideal Tire & Rubber Co., Cleveland, manufacturer of "Greyhound" tires and tubes.

J. C. McQuiston, manager of the department of publicity of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, served as chairman of the exhibition committee of the Pennsylvania Electric Association which held its annual convention at Bedford Springs, Pennsylvania, on September 3-6, 1919. An unusual feature was the housing of the exhibitors in a large tent divided into separate booths with a wide aisle in the center.

Robert I. Wishnick, formerly general manager of A. Daigger

& Co., manufacturers, importers and exporters of chemicals, oils, and colors for the rubber trade, has been elected vice-president of the company.

Louis Birkenstein, of S. Birkenstein & Sons, Chicago, Illinois, rubber scrap dealers, has resigned his position as chief of the Surplus Property Division, office of the Director of Storage, his resignation becoming effective September 1, 1919.

Richard Blickenderfer, formerly with the Thermoid Rubber Co., Trenton, New Jersey, has been appointed manager of sales for the Dural Rubber Corp., Flemington, New Jersey, at Philadelphia, Pennsylvania.

H. G. Vanderhoef has been promoted to the position of general sales manager of the hard rubber and electric storage battery-jar department of The Brunswick-Balke-Collender Co., Chicago, Illinois.

Sam J. Turnes, until recently advertising manager of The Brunswick-Balke-Collender Co., Chicago, Illinois, has been promoted to the position of general sales manager of the tire department, succeeding John W. Maguire, resigned.

William J. McDavid, until recently associated with the Russian American India Rubber Co., the Treigolnik of Petrograd, has opened an office at 111 Broadway, New York City, and been appointed correspondent of L. Sutro & Co., London, England.

Dan McAvoy has been appointed manager of the Omaha, Nebraska, branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania. He has been acting as traveling representative of the company in Nebraska and Iowa.

Alfred Varian, Jr., formerly with Charles F. Garriques Co., is now connected with the C. B. Peters Co., 15 Maiden Lane, New York City, and will continue to handle wood pulp for the trade.

A. E. Gordon has been promoted from the position of superintendent to that of general manager of the Beacon Tire Co., Beacon, New York.

George L. Sullivan, for three years advertising manager of The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has resigned to associate himself with the J. Walter Thompson Co., advertising agency, New York City.

Robert Duncan, of Duncan & Fraser, Limited, Adelaide, South Australia, is in the United States on business.

## CANADIAN NOTES.

The Stanyon Rubber Co., Limited, is now located at New Toronto, Ontario, the factory being at 27 Brock avenue and the office at 25 Manning Arcade. The company manufactures dipped rubber goods, featuring toy balloons and nipples. The factory is of fireproof concrete construction, two stories high, with 30,000 square feet of floor space. The officers of the company are: Henry Stanyon, president; Charles H. Stanyon, vice-president; and Leonard L. Stanyon, secretary-treasurer.

The I. T. S. Rubber Co. of Canada, Limited, has recently removed from 28 Temperance street to 22-26 Mulock avenue, Toronto, Ontario.

George L. McCrae has been appointed manager of the sole and heel department of the Goodyear Tire & Rubber Co., Limited, Toronto, Ontario. He will be assisted by C. R. Harshman. Mr. McCrae has been with the company eight years, and will continue to manage the mechanical rubber goods department.

Ames-Holden-McCready, Limited, Montreal, Quebec, of which T. H. Rieder is president, has opened branches in Halifax, Quebec City, Ottawa and London, Ontario, and Calgary, and are planning to open branches in Regina and Saskatoon. Rubber footwear as well as leather will be carried.

IN THE BIG PLANT OF THE GOODYEAR TIRE & RUBBER CO., AT Akron, Ohio, 23,000 workers are employed. The factory continues in operation twenty-four hours each day, in three shifts of eight hours each.

### THE RUBBER TRADE IN MASSACHUSETTS.

*By Our Regular Correspondent.*

Boston has been passing through a critical experience the past month, when the city police went on a strike, leaving the city unguarded, and many of its stores were looted by hoodlums, while criminals flocked here from other cities to take advantage of the lack of police protection. The state guard and the local militia were called out to police the city, thus drawing many men from business for such duty. Many, perhaps all the rubber factories, had employees who were thus called from their work and it is a credit to the industry generally that every man thus called to service has been paid his full wage during his absence from work, or the difference between his compensation regularly received and that paid by the state. The United States Rubber Co., which has thirteen factories in Massachusetts, took this view of the situation, as did the other manufacturers having fewer or less important establishments.

\* \* \*

H. P. Ballard, secretary of the Boston Rubber Shoe Co., Malden, is the colonel of the Twelfth Regiment of the State Guard, and is on active duty in that capacity at present, with headquarters at the armory at Cambridge. Among his captains is E. H. Kidder, Boston branch manager of the United States Tire Co.

\* \* \*

Stowe & Woodward Co., Newton Upper Falls, Massachusetts, has nearly completed a three-story extension to its main building, and is equipping it with the latest approved machinery for the manufacture of rubber-covered rolls of the largest dimensions. For some years this concern has made smaller rolls, such as are used in tanneries, bleacheries and dye works. But with the purpose of extending this department the new addition has been built, and the roll department has been placed in charge of Raleigh C. Adams, who was for 25 years with the Boston Belting Co., and for much of that time superintendent of the roll department. The equipment is adequate for covering paper-mill rolls of the largest dimensions, even up to those 250 inches in length, thus enabling the factory to meet the utmost requirements of the paper-making trade.

\* \* \*

The New England branch of the Acme Rubber Manufacturing Co., Trenton, New Jersey, which has been located on Devonshire street near Summer street, Boston, for nearly a score of years, has been moved to 134 Summer street, where it occupies the entire second floor, thus giving a very commodious stock room where a line of "Red Letter" tires and tubes, a large variety of hose, and a good line of molded goods are carried. F. H. Albee, the New England manager, has been connected with this branch ever since it was started. He has a large acquaintance with the trade, and reports a marked increase in the business since his removal to the new location.

\* \* \*

The Boston Belting Co. is pushing ahead with a very considerable domestic trade, and an export demand which is on the increase. At present the company is at work on a contract for several large conveyor belts, one of which is 42 inches wide and nearly 800 feet long. There is also a good demand in the hose department, including a large amount of oil suction hose for one of the large oil-producing companies. The export demand mentioned is mainly for hose, the company's brands having made a reputation for standard goods in several foreign countries.

\* \* \*

J. C. Haartz, Inc., 10 High street, Boston, has equipped a rubber mill at New Haven, Connecticut, for the manufacture of calendered goods including materials for automobile manufacturers and spreader coated fabrics. "Paramount" auto top materials and "Haartz mackintosh cloth" will be featured. The Forsyth Dyeing Co. is a department of this concern, which

effects close cooperation between dye-house and rubber mill. The company is capitalized for \$1,000,000 common and \$500,000 preferred stock. The officers are: J. C. Haartz, president and treasurer; D. B. Stevens, vice-president; and Thomas Forsyth, assistant treasurer and general manager at New Haven. The above, together with Leslie Forsyth and L. A. Pickard, constitute the board of directors. The rubber mill is under the management of I. Frank Burnham, formerly superintendent of the Stoughton Rubber Co. Division of the United States Rubber Co., Stoughton, Massachusetts.

\* \* \*

J. Frank Dunbar Co., Inc., importer and dealer in crude rubber, for a number of years at 201 Devonshire street, Boston, removes October 1 to 166 Essex street, Room 51. This is in a most convenient location, but a short distance from the South Terminal Station, and adjoining the commodious headquarters of the New England Shoe and Leather Association and the Boston Boot and Shoe Club.

\* \* \*

The Tyer Rubber Co., Andover, Massachusetts, has added a line of standard cord tires to its regular output.

At the recent Welcome Home Celebration in honor of the Andover soldiers returned from the war, the Tyer company participated in the parade with four trucks arranged as floats, of which two represented "The Sinking *Lusitania*" and "The Peace Table," bearing the slogans, respectively, "This started it" and "This finished it."

\* \* \*

The C. & C. Rubber Co., Stoughton, Massachusetts, has discontinued its Boston office, and is concentrating its entire business at its Stoughton plant. A new building is in process of erection which will add about 7,000 square feet of floor space. The company manufactures raincoats, and has just added a new line of industry, the manufacture of blankets, having purchased a number of automatic looms from the American Felt Co., which has discontinued, and is dismantling its Hyde Park Mills department. The C. & C. Rubber Co. will start with an equipment of six looms, to be increased later as the new industry develops.

\* \* \*

The Hood Rubber Co. is building a four-story brick structure at its plant at East Watertown, which, when completed, will enable the company to rearrange some details of the manufacture to expedite its business.

\* \* \*

Colonel Harry E. Converse, president of the Boston Rubber Shoe Co., who has been in somewhat poor health the past six months, is now in the West recuperating, and reports are to the effect that he is steadily and rapidly improving.

\* \* \*

At a recent meeting of the directors of the First National Bank of Boston C. Sinclair Weeks and A. Stanley North were elected assistant cashiers.

\* \* \*

Miss M. G. Webber, for the last three years in charge of the outdoor advertising of The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has been promoted to the position of advertising manager of the company.

### THE RUBBER TRADE IN NEW JERSEY.

*By Our Regular Correspondent.*

TRENTON RUBBER MANUFACTURERS report that business is good at the present time and that fall and winter prospects are excellent. The outlook for tires and tubes is very good while the other branches of the industry are also picking up following the summer months. The Ajax Rubber Co. has placed a number of new hands at work because of the increase in trade, and the United & Globe Rubber Co. is busy in all its departments at the present time.



The Thermoid Rubber Co., Trenton, has engaged the Osborn Engineering Co., Cleveland, Ohio, to prepare plans for a three-story building, 100x275 feet, of reinforced concrete brick and steel.

\* \* \*

The United States Rubber Co. recently unveiled a large bronze tablet at its plant at New Brunswick, New Jersey, in honor of the thirteen men who entered the war from that factory, and in honor of Chester Brokaw, who made the supreme sacrifice. Desher Wilmot, factory superintendent, was in charge of the services. Miss Hattie Brokaw, sister of Chester Brokaw, unveiled the tablet, which bears the following inscription: "In honor of the employes of the United States Rubber Company, Jersey factory, who at the call of their country, laid aside their vocations and entered the service to fight in the great war for world wide liberty, 1917-1919."

\* \* \*

The Stanwood Rubber Co. is installing new machinery in its plant at Elizabeth, New Jersey, under the direction of Edward Hutchens, vice-president and engineer. A 175-foot stack is being erected for the 1,000-kilowatt power plant.

\* \* \*

The pumping plant at the works of the India Rubber Co., New Brunswick, New Jersey, was partially destroyed by fire recently.

#### THE RUBBER TRADE IN OHIO.

*By Our Regular Correspondent.*

**L**ITTLE INTEREST is shown here in resumption of trade with Germany, or in foreign trade as a whole. Domestic business is so good and the demand for tires so great that there is little time to think of the resumption of trade with Europe.

At the Firestone, Miller, Goodrich and Goodyear offices it is stated that the financial and credit situation in Germany is the greatest drawback not only to the rubber but to all trades, and that the lack of shipping facilities is another factor which renders commercial exchanges with Europe almost impossible. France, England and Italy, it is asserted, are making deliberate efforts to keep out American trade in order to foster their own industries, while Holland and Sweden are very anxious to get American rubber goods. The credit situation in both of these countries, however, is also unfavorable.

Local factories are looking to the Orient as the great coming market for manufactured goods. China and Japan are beginning to purchase rubber products in large amounts, and in a few years it is believed that the business with these countries will have risen to a high level.

#### AKRON NOTES.

All the Akron rubber companies have agreed to cooperate with the municipal university in a plan whereby employes will be able to work part of their time and spend the remainder in school. One of the plans sanctioned is that two men may hold one job, each working half of the regular shift.

\* \* \*

Several companies have placed \$6,000,000 in the hands of their directors to solve the housing problem which is the chief cause of the inability of the rubber factories in Akron to meet the demand for tires.

The Home Owners Investment Co., embracing all the big rubber manufacturers and other Akron business men, are accepting applications from prospective home owners if the prospects have 10 per cent of the total cost of the home they wish to build, and to date approximately 200 houses have been started by those whose applications have been accepted.

The Coventry Land and Improvement Co., a concern which has been sponsored by H. S. Firestone, has taken out building permits for 62 additional homes to be built in Firestone park, making a total of 450 houses which the company will have built and sold within the past year.

The sales of the Firestone Tire & Rubber Co. from November 1, 1918 to September 1, 1919, amounted to \$69,475,197.14, which was an increase of more than \$3,000,000 over the same period of last year. August was the biggest month the company ever had, business being \$2,456,994.30 more than for August, 1918. The company will build a new \$400,000 factory in the rear of Plant No. 2 for the manufacture of tires.

The Firestone Tire & Rubber Co. is helping to reduce the high cost of living for their employes by opening a cooperative store in the Firestone Club House. The store is being operated on a cost plus ten per cent basis and is well patronized.

\* \* \*

W. W. Wildman has resigned as president and general manager of The Portage Rubber Co., Akron, but will retain his position as a director and his interest in the company.

\* \* \*

John W. Maguire, president of the Mid-West Rubber Manufacturers' Association, has been elected vice-president and general manager of The Portage Rubber Co., at Akron, Ohio, to fill the position of W. W. Wildman, who recently resigned. Mr. Maguire will have full charge of the company's affairs and will immediately inaugurate an energetic campaign for increased business.

Mr. Maguire has been identified with the rubber industry for over twenty years. He was formerly general manager of the rubber sales department of the Brunswick-Balke-Collender Co., having joined the organization when the rubber tire department was added to the company's activities about four years ago. Previous to this time Mr. Maguire was associated with the Republic Rubber Co. for 10 years.



JOHN W. MAGUIRE.

Reports from The Goodyear Tire & Rubber Co. indicate that the industrial democracy which was inaugurated in August is working even better than was expected, by the employes.

The conduct of the company with regard to matters of policy as well as the settlement of all difficulties between the management and the men, is in the hands of two legislative houses made up along the lines of the national House of Representatives and the Senate. The whole factory has been divided into districts and wards, and the men vote for their representatives by the secret ballot system. In the House there are 80 representatives and in the Senate there are 40. P. W. Litchfield, factory manager, sponsored the system's adoption.

F. A. Seiberling, president of The Goodyear Tire & Rubber Co., upon his return from the West, stated that the plant being built by the company in Los Angeles is not to be taken as an indication that the company expects to cease growing in Akron.

The new plant is intended primarily to take care of the ever-increasing western trade. The cost of bringing crude rubber from San Francisco to Akron and then hauling the tires back over the same route can be materially reduced by building a plant on the Coast where the crude rubber of the Orient and the cotton of plantations in the Southwest can be brought together.

Mr. Seiberling stated that as soon as housing conditions made it possible the company will employ 10,000 more men in order to operate the Akron plant at 100 per cent instead of 70 per cent as at present.

George Hockensmith, well known in the aeronautic field, and formerly overseer of the Goodyear experimental station in Ak-

ron is reported as being the head of a \$1,000,000 trans-Pacific navigation company which is being organized in Los Angeles.

\* \* \*

John F. Rae, for two years a member of the Bureau of Municipal Research in Akron, is the latest man drafted by the Goodyear Tire & Rubber Co. for an executive position. He is well known in New York, and recently assisted in a survey of the state institutions of Virginia.

\* \* \*

A new aviation school has been opened in Akron with John F. Aston as general manager. The purpose of the school is to train air pilots and also to make photographs and carry passengers. Lieut. H. C. Miller is chief pilot.

\* \* \*

The Mohawk Rubber Co., Akron, Ohio, organized six years ago, has found it necessary to construct a substantial addition to its factory, because of the heavy demand for its tires, and especially its cord tires, which are a comparatively recent



PLANT OF THE MOHAWK RUBBER CO.

addition to its line of manufacture. The accompanying illustration shows the factory as it is to-day, including the new building recently completed.

#### MISCELLANEOUS OHIO NOTES.

Buildings for several new rubber factories are being erected in the vicinity of Akron. The Arnold Rubber Co., with a capitalization of \$50,000, is constructing a new building in Ravenna. Rubber heels are to be the principal product and about 50 persons will be employed.

\* \* \*

The Cascade Tire & Rubber Co. is breaking ground for its plant at Ravenna, Ohio. The capitalization of this company is \$1,000,000, and approximately 300 men will be employed when operations are begun. Tires will be the principal product.

\* \* \*

The Mason Tire & Rubber Co., Kent, Ohio, reports progress in the erection of its new buildings which it expects to occupy by January 1, 1920. The additions comprise about 125,000 square feet of floor space and include a three-story heater room addition which will house six additional vulcanizers; a three-story calender building; a three-story tire building; a complete two-story solid tire manufacturing plant comprising an entire wing, having its own mills, tubing machines, and vulcanizers; and a new garage to house company and employees' cars. At the same time the present cafeteria will be enlarged to three times its present size to accommodate the prospective additional employees of The Mason Tire & Rubber Co. and of The Mason Cotton Fabric Co. The office building is also being trebled. All the additions will be of reinforced concrete steel construction with brick facing.

\* \* \*

The Anchor Rubber Co., Barberton, Ohio, which recently suffered the loss by fire of its leased plant at Columbus, has

purchased ground in Barberton and is erecting a two-story building, 45 by 100 feet, to cost \$25,000. The company will manufacture druggists' sundries, mechanical rubber goods, and advertising and toy balloons.

\* \* \*

The Pharis Tire and Rubber Co., Newark, Ohio, has purchased five acres of canal property from the state and is now planning an addition for the increased production of fabric tires and the manufacture of cord tires. The new structure will be three stories high, 100 by 145 feet, with complete boiler house and steam plant. It is hoped that the new building will be ready for occupancy before winter.

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The Pelletier Rubber Co., Cincinnati, Ohio, manufactures a tire interliner which it calls the "Lyner Tyre."

\* \* \*

The Wayne Tire and Rubber Co., Orrville, Ohio, has succeeded to the business of the Orrville Rubber Co., and has assumed all liabilities and acquired all assets. The management, however, will remain the same, the change being only in name and ownership. H. R. Platt is general manager.

\* \* \*

The Owen Tire & Rubber Co., Bedford, Ohio, has increased its board of directors from five to seven, adding O. M. Dickson, secretary-treasurer of The Tuscora Rubber Co. E. M. Blatz was reelected director and vice-president. Mr. Blatz is president of The Tuscora Rubber Co., which is building a new plant between Dover and New Philadelphia, Ohio.

\* \* \*

The Galion Rubber Co., Galion, Ohio, has bought the Flat Iron Building, formerly leased, and will build a two-story addition. J. N. Smeltzer is president and E. F. de la Croix, vice-president.

#### PRESIDENT OF THE MASTER TIRE AND RUBBER COMPANY.

WILLIAM B. RUSTON, president and general manager of the recently incorporated Master Tire & Rubber Co., Dayton,



WILLIAM B. RUSTON.

Ohio, is peculiarly well-fitted by ability and experience for the position, having been in the rubber business more than a score of years. He entered the employ of The B. F. Goodrich Co., Akron, Ohio, as errand boy in 1897, and his rise was steady and sure, for five years later he was transferred to the Philadelphia branch as assistant branch manager. After eight years there he resigned and tires manufactured by the Lee formed a company to market the Tire & Rubber Co., Conshocken, Pennsylvania.

From this business he resigned to become associated with the Thermoid Rubber Co., Trenton, New Jersey, as salesman, covering five States, and working up a business which placed him at the head of the sales force of that company in the amount of goods sold. After occupying this position for five years he accepted the offer of the Dayton Rubber Manufacturing Co., Dayton, Ohio, to sell its goods in certain territory on a commission basis. So successful did he prove in this work that the company management called him to the home office to take entire charge of the sales department, and this position he resigned last April to take an active part in the formation of The Master Tire & Rubber Co., which will manufacture cord tires at Dayton, Ohio.

## NEW MCGRAW SALES MANAGER.

**H.** M. BACON, the newly appointed sales manager of the McGraw Tire & Rubber Co., East Palestine and Cleveland, Ohio, is one of the most widely known executives in the



H. M. BACON.

automotive industry. As one of the pioneers, he became interested in the manufacture of motor cars in the early days, and for some time was identified with the industry in Detroit, Michigan. This gave him close touch with the tire and accessory field, and in 1911 he joined the Diamond Rubber Co., Akron, Ohio, three years later, assuming full charge of the sales of Diamond tires and accessories, a position which he held until August of the present year, resigning to accept the management of sales for the McGraw Tire & Rubber Co., with headquarters at Cleveland, Ohio. Previous to establishing himself there he is making a tour of all the McGraw agencies throughout the country to come into personal touch with the representatives and salesmen.

## MID-WESTERN NOTES.

*By Our Regular Correspondent*

**T**HE Wilson Tire & Rubber Co., Springfield, Illinois, has recently completed a 100 by 200-foot addition to its factory building, in the form of a court to the old building, to be used as a vulcanizing shop. Two new vulcanizers and additional tire building equipment has been installed; the new addition and equipment representing an investment of about \$60,000.

The Lincoln Highway Tire Co. has placed orders for considerable additional machinery and equipment to keep pace with the growing demand for the company's tires and tubes. The company contemplates the building and equipment of a new unit early in 1920.

The Great Republic Tire & Rubber Co., with the executive officers in Muskogee, Oklahoma, which recently began operation of their new factory at McAlester, Oklahoma, plans to increase its production to 150 tires and 250 tubes daily. A full line of accessories as well as rubber heels and soles will also be manufactured. W. H. Owens is vice-president and general manager, and C. W. O'Donnell is factory manager. Mr. O'Donnell has had many years of experience in the manufacture of high-grade tires and tubes, having been formerly connected with the Mohawk, Racine, Perfection and others.

At a meeting of the board of directors of the Standard Four Tire Co., Keokuk, Iowa, July 18, three vacancies were filled, making the new board of directors as follows: J. B. Gabeline, Burlington, Iowa; Henry Trout, Mt. Pleasant, Iowa; W. G. Feignspan, Quincy, Illinois; L. L. Birkett, West Liberty, Iowa; James Guthrie, Hamilton, Illinois; T. Thompson, Brighton, Iowa; E. P. Armknecht, Donnellson, Iowa; E. S. Anderson, Oskaloosa, Iowa; Lee T. Gobble, Fairfield, Iowa.

A new addition is being added to the present plant which when completed, will increase the capacity from 500 to 1,000 tires and tubes a day. By the first of the year, this company expects to have a cord tire on the market. The personnel of the new organization follows: President and general manager, J. B. Gabeline; vice-president, T. Thompson; secretary,

C. O. Frazier; auditor and temporary treasurer, W. E. Vance; general sales manager, F. R. Eyer. Mr. Eyer was formerly western district manager of the Amazon Rubber Company of Akron, Ohio, and Mr. Frazier has been connected with the Standard Four Company ever since its organization.

The Archer Tire & Rubber Co., Minneapolis, Minnesota, is putting in a new battery of boilers which will double its power plant; also a converter for the calender and a new sixty-inch vulcanizing press. It has recently added a full line of equipment for all sizes of fabric casings and has increased its output in the past five months about 120 per cent. The production for the month of August will exceed 450 tires and 600 tubes a day. A year ago the production was 36 tires a day and no tubes.

The Ten Broeck Tyre Co., Louisville, Kentucky, has discontinued the manufacture of 2,500 mile guaranteed casings and will soon be in a position to fill orders on an 8,000-mile guaranteed semi-cord casing. The company has made some extensive improvements in its plant and the officials expect to direct their efforts towards the production of a casing that will give mileage far beyond the 8,000-mile guarantee.

Walter H. Grote, at one time connected with the United States Tire Co., The McGraw Tire & Rubber Co., and the National Tire & Rubber Co., is now factory superintendent and assistant general manager for the Archer company. Mr. Nicol, former general manager, has resigned and Robert J. Garrene, vice-president, has taken charge of the management of the company.

The Nebraska Tire & Rubber Co., Omaha, Nebraska, has recently completed its plant and is now prepared to produce 500 finished tires and tubes per day. The new factory building contains 35,000 square feet of floor space and has been equipped with new and modern machinery. The company owns one and one-half acres of land and its transportation facilities are excellent. The factory organization is headed by W. W. Wuchter, general manager, and J. W. Whighamas, chief chemist; both are experienced rubber men.

The Mason Tire & Rubber Co., Kent, Ohio, has appointed E. E. Gessert, manager of its branch office at 450 Jackson street, Milwaukee, Wisconsin, controlling the company's business in Wisconsin and northern Michigan.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has appointed Harry R. Brownless district manager of the Michigan territory, with headquarters at Detroit.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has reopened its office at 1003 City Trust Building, Indianapolis, Indiana, in charge of Knox Easterling. This office was closed during the war, but increasing business has now made it necessary to have headquarters in Indiana.

The Premier Tire & Rubber Co., Montgall and Nicholson avenues, Kansas City, Missouri, has purchased a building at that address, containing approximately 20,000 square feet of floor space, and sufficient ground for another building 85 by 200 feet, three stories high, for which it is soliciting bids. The officers of the company are: Grover Jocke, president; F. W. Willis, vice-president; O. W. Dunham, secretary and treasurer. L. E. McKim, the chemical engineer and rubber expert, has been secured as general manager. He was formerly with the Republic Rubber Corp., Youngstown, Ohio. The company is making tires and tubes by a special method called McKim's "Tensilene" process.



The Dural Rubber Co., Flemington, New Jersey, is now distributing its products through dealers in Denver and Salt Lake City. Edward R. Novak has recently been appointed the company's representative in charge of sales in the Central Western States. Floyd R. Biggs, formerly with The Fisk Rubber Co., Chicopee Falls, Massachusetts, is in charge of Western sales for the Dural company.

\* \* \*

The Belden Manufacturing Co., 23d street and Western avenue, Chicago, Illinois, has let the contract for Building No. 8, four stories high, on West Van Buren street, to be 90 by 114 feet and contain approximately 10,000 square feet of floor space.



WEST VAN BUREN STREET PLANT OF BELDEN MFG. CO.

The structure will be of reinforced concrete, entirely fireproof, trimmed with red brick. Machines will be driven by individual motors as in the present factory, thus eliminating line shafts and belts.

\* \* \*

The A. J. Stephens Rubber Co., 15th street and Chestnut avenue, Kansas City, Missouri, has increased its capital to \$1,500,000 for the purpose of manufacturing tires and tubes as well as its tire accessories and fabric products. A. J. Stephens, founder of the business three years ago, becomes president and general manager of the enlarged corporation.

#### RACINE AUTO TIRE CONFERENCE.

More than 200 branch managers, salesmen and department managers of the Racine Auto Tire Co. attended the sales conference at Racine, Wisconsin, September 23-25, which was presided over by Clarence H. Wright, the secretary-treasurer and general manager of the company.



CLARENCE H. WRIGHT.

over for the week of the conference, and golf, bowling and tennis were included in the schedule of entertainment.

This conference also marked the tenth anniversary of Mr. Wright's connection with the company, which in 1909 was manufacturing a leather-covered steel-studded tire. This tire was discontinued and through the efforts of Mr. Wright the "Horse-Shoe" tire was evolved and placed on the market. This year the company has added a cord tire to its line.

At the conference many plans were discussed for the further enlargement of the business. The Racine Country Club was taken

#### ROSENWALD & WEIL SALESMEN VISIT KINZIE RUBBER PLANT.

The Kinzie Rubber & Manufacturing Co., Chicago, Ill., entertained the business heads and salesmen of Rosenwald & Weil, clothing manufacturers, that city, on August 28, on the occasion of the six-day sales convention of the latter mentioned con-

cern. The party, to the number of 50 or 60, was conducted through the Kinzie factory, where the various processes were explained and the manufacture of rubberized fabrics and clothing demonstrated. At noon a substantial lunch was served and in the afternoon H. T. Kessler, general manager of the Kinzie Rubber & Manufacturing Co., gave a talk on "Rubber Goods and How They Are Made," and L. J. Ulber told "Why I Took Up the Selling of Kinzie Products."

The Friday session of the convention was devoted mainly to a golf tournament at the Harlem Golf Grounds, when trophies provided by Max Magnus, manager of sales of Rosenwald & Weil, were competed for.

#### PACIFIC COAST NOTES.

*By Our Regular Correspondent*

A. F. OSTERLOH, secretary of The Goodyear Tire & Rubber Co., has been elected vice-president and general manager of the new Goodyear company in Los Angeles, California. He



A. F. OSTERLOH.

started as a salesman in the Chicago territory four years after the organization of the Goodyear company and subsequently became branch manager and then manager of the western division of the sales department. He was brought to Akron as assistant secretary and in 1915 was made secretary.

It is expected that a large number of men from the Akron factory will be taken to Los Angeles as soon as the plant there is ready for operation.

\* \* \*

The Advance Rubber Co., Brooklyn, New York, has opened a branch at 721 South Olive street, Los Angeles, under the management of William J. Hartman, who has been with the company for a number of years, both in the factory and as a salesman.

\* \* \*

The Dural Rubber Corp., Flemington, New Jersey, is now distributing its products through dealers in Los Angeles, San Francisco, Portland, Seattle, and Spokane. E. H. Wilson, president and general manager of the company, has just been visiting the Coast, where he found business particularly good.

\* \* \*

The Huntington Rubber Co., Los Angeles, has taken the agency of the Miller Ad-On-a-Tire of the Miller Rubber Co., Akron, Ohio.

\* \* \*

M. G. Haines, Pacific Coast representative of the Polack Tire & Rubber Co., recently paid a short visit to Los Angeles. During the war he was a lieutenant in the quartermaster's department.

\* \* \*

The annual get-together business meeting of the Los Angeles, San Diego and Arizona branches of the United States Rubber Co. was held recently in the general offices of J. B. Magee, manager of the Southern California division. Plans were mapped out for the fall drive and the progress that has been made by the company in the Southern California territory was shown in the figures submitted by Mr. Magee. The thirty-five members of the conference lunched at the Los Angeles Athletic club and wound up at one of the beaches.

\* \* \*

Elmer S. Firestone, Los Angeles representative of the Firestone Tire & Rubber Co., Akron, Ohio, has purchased a home

in Los Angeles. After completing the organization of the San Francisco branch, he was called east to organize the Buffalo, New York branch. After several years there he was transferred to Los Angeles and has been in charge here ever since.

\* \* \*

Frank A. Vanderlip, recently elected director of the United States Rubber Co., and former president of the National City bank of New York, who has been in Los Angeles for two weeks, was given a rousing reception by the San Pedro Chamber of Commerce just previous to his departure. Mr. Vanderlip is the owner of the immense Palos Verde ranch, which adjoins San Pedro and spent a quiet vacation at his residence there during his sojourn in Los Angeles.

In his address Mr. Vanderlip pointed out that all Europe is upset and unable to recover her financial and industrial equilibrium, and that the unrest has spread to this country.

"The solution of our problem of unrest will probably be found," he said, "but it will not be found by the men who are resentful toward capital, and are inclined to do just enough work to 'get by' from day to day.

"The great idea all must consider is production. The wealth of the world lies in the day's work. Russia didn't think of production. She divided up whatever there was in sight, and now that it is all gone she is starving."

Mr. Vanderlip pointed out that this country occupies the happy position of having all raw materials save rubber, and of being able to sell all it can produce. The big thing during the next two years, he thinks, is cooperation, that all may be kept busy at reasonable wages, maintaining production at a high point, in order to supply other countries which are unable to produce what they need because of raw material shortage and lack of credits.

\* \* \*

C. L. Smith, Los Angeles, has been appointed Southern California distributor of Dural red tubes. E. H. Wilson, president of the Dural Rubber Corp., was in Los Angeles recently and covered much of the local territory with Mr. Smith.

\* \* \*

R. G. Henderson, representative of the Gates Rubber Co., Denver, Colorado, has completed arrangements with the Warfield Tire Service Co. for handling the Gates Half Sole Tires in Los Angeles. A model Gates plant has been set up at 938 South Main Street.

#### RUBBER TRADE INQUIRIES.

**T**HE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(739.) Request is made for addresses of manufacturers of woven fabric about  $4\frac{3}{4}$  inches wide, selvage both edges, made with wire warp and cotton weft.

(740.) Inquiry is made for the addresses of concerns making tire-branding irons.

(741.) A reader asks for the addresses of concerns handling black hypo.

(742.) A subscriber requests information about "Rub-R-Glu," including address of manufacturer.

(743.) A foreign correspondent desires to represent United States manufacturers of organic accelerators in France.

(744.) A Japanese correspondent desires to secure the agency for the following rubber goods: Billiard cushions, printers' blankets, matings, garden hose, and steam hose.

(745.) A subscriber inquires for the addresses of manufacturers of sheet zinc for use on cutting tables.

(746.) A request has been received for addresses of manufacturers of joint hammering machines.

(747.) A reader inquires where the following can be obtained: "Algin gum," "Ruberoid," "Cellit," and "Insullac."

(748.) An inquiry has been received for the addresses of makers of instruments for measuring hardness and resiliency of rubber.

(749.) A writer asks for compounds for dipped goods and the acid and vapor cure.

(750.) A manufacturer asks for the address of the makers of "Saxolin," a paper product which can be frictioned with rubber compound.

(751.) Inquiry is made for the address of the manufacturer of "Textilose," an unfriictioned paper product.

#### TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

*Addresses may be obtained from the Bureau of Foreign and Domestic Commerce or its district or cooperative offices. Requests for each should be on a separate sheet, and state number.*

(30,474.) A manufacturing company in Greece desires to secure an agency for the sale of pneumatic tires. Correspondence may be in English.

(30,502.) A firm in Russia, which is opening a branch office for the distribution of supplies for hospitals, doctors and dentists, desires to purchase rubber articles for sanitary use. Correspondence may be in English.

(30,510.) The partner of a firm in France desires to be placed in communication with manufacturers of canvas who specialize principally in duck for pneumatic tires, with a view to selling this article to French manufacturers.

(50,519.) A merchant from Cyprus, who is in the United States for a short time, desires to secure an agency for the sale

(30,562.) A manufacturing chemist in Bohemia desires to of rubber goods in Cyprus and Syria.

purchase large quantities of rubber goods. Quotations, with samples, are requested.

(30,564.) An agency is desired by a merchant in France for the sale of canvas shoes with best quality of rubber soles. Quote c. i. f. French port. Correspondence in French.

(30,575.) A man who has been in the United States for several years now planning to go to England, desires to secure the agency for the sale of rubber overshoes.

(30,578.) A firm in Italy desires to purchase elastic webbing. Quote c. i. f. Italian port. Terms cash on receipt of goods. Correspondence in Italian.

(30,589.) A dealer in France desires to purchase or to handle on commission or consignment rubber tires.

(30,592.) An American export corporation is soon to send a representative to Europe and invites immediate offers from manufacturers of tires and rubber goods. Catalogs in duplicate and price lists, subject to confirmation, are requested.

(30,602.) A commercial agent in Czechoslovakia desires to secure agencies for the sale of solid tires.

(30,603.) A company of commission agents in France desires to secure agencies for the sale of rubber.

(30,625.) A commercial agent, representing a firm in Sweden, is in the United States and wishes to purchase rubber goods for hats.

(30,650.) An agency is desired by a man in Italy for the sale of pneumatic tires. Quotations should be given c. i. f. Italian port. Correspondence in Spanish.

(30,679.) A firm in Roumania desires to purchase rubber articles. Correspondence may be in English.

#### OIL FROM HEVEA SEEDS.

*Hevea seeds contain 52 per cent of oil, from which a good quality of dark factice can be made, or with sulphur chloride it forms a white factice darker than that obtainable from colza and castor oils, and resembling that made from linseed oil. (A. Dubosc in "Le Caoutchouc et la Gutta-Percha.")*

## Activities of The Rubber Association of America.

### DIVISIONS MEETINGS.

**RECLAIMERS' DIVISION.** The meeting referred to in the September issue as planned for Tuesday, September 9, was postponed indefinitely due to the inability to secure a quorum. A meeting will probably be arranged for early in October.

**THE RUBBER CLOTHING DIVISION.** The Rubber Clothing Manufacturers' Division and the Calendered Rubber Clothing Section of that division held meetings at the Yale Club, on September 4, which were well attended and interesting because of the number of important subjects given attention and the spirit of constructive cooperation that marked the manner in which the subjects were handled.

**THE TRAFFIC DEPARTMENT.** On September 18 and 20 the Traffic Department held the largest meeting since its inception, both from the standpoint of the attendance and the number and importance of the subjects given attention. The Traffic Committee was in session two full days and, besides disposing of the large docket, was in conference with officials of the American Railway Express with a view to bringing about an alleviation of certain conditions now existing in connection with the transportation of rubber products by express, and it is believed that when the conclusions of the conference are put into practice the result will be beneficial to the trade.

**MECHANICAL RUBBER GOODS DIVISION.** On Friday, September 19, there was held a meeting of the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division at the Yale Club followed by luncheon and a general meeting of the Division, which was unusually well attended. Plans were laid for the strengthening of the status of the Mechanical Goods Division in its relation to its membership and several specific subjects of interest to mechanical goods manufacturers in general were given attention. The Executive Committee voted to hold a regular monthly meeting on the third Tuesday of every month beginning with October, 1919, in line with the program for the increasing of the efficiency and importance of the work of the Division.

**TIRE DIVISIONS.** There was held a joint meeting of the Executive Committee of the Pneumatic and Solid Tire Manufacturers' Divisions, September 23, which was full of interest by reason of its being the first meeting of the sort for several months and because of there having been received by the Association from tire manufacturers a number of subjects of importance involving trade principles and practices which were thought to need attention. A docket including more than a dozen subjects of broad interest was disposed of besides several other matters which were brought up during the course of the session.

**RUBBER SUNDRIES.** A call has been issued by the Association for a meeting of the Executive Committee of the Rubber Sundries Manufacturers' Division for the evening of October 7, at the Union League Club, New York City, and on the following day, October 8, at 1 p. m., a general meeting of the Division is to be held at the Yale Club.

### TRADE INFORMATION SERVICE.

The Association has just concluded arrangements with a Washington Bureau for the furnishing of a daily trade information service which will place the Association in a position to inform its membership promptly of the development of matters of interest, and which will provide a more authoritative and prompt source of information on many important matters than has been available to the Association heretofore.

### INDEX TO MANUFACTURERS IN THE RUBBER INDUSTRY.

The Rubber Association is preparing to reissue the "Index to the Manufacturers of the Products of the Rubber Industry,"

which was issued by the War Service Committee in May, 1918, in order to bring it up to date in respect to those changes in manufacturers' lines which may have followed the conclusion of the war, and to correct certain inaccuracies which found their way into the first issue.

### WORLD'S COTTON CONFERENCE.

There is strong likelihood of arrangements being effected for the attendance of representatives of the rubber industry at the World Cotton Conference in New Orleans in October, which appears to be very desirable, when consideration is given to the relation of the rubber industry to the cotton industry, in the matter of consumption.

### THROUGH EXPORT BILLS OF LADING.<sup>1</sup>

NEW YORK, August 26, 1919.

To the firm members of The Rubber Association of America, Inc.:

As you are probably aware, the United States Railroad Administration has resumed the acceptance of through export bills of lading via the North Atlantic Ports, when they are founded on written ocean contracts and only when shippers give written guarantee that any storage charges accruing at the seaboard will be paid.

Precedent to the acceptance of commercial freight in carloads for export, there must be presented by the shipper to the railroad agent at point of origin a "G. O. C. permit" issued by the traffic control manager at port of export on application from the agent of the steamship line booking the cargo, or from representatives of foreign governments or from the United States Food Administration.

The prepayment of ocean charges to the inland carrier is not considered desirable by the United States Railroad Administration, particularly on shipments handled on a measurements basis. Bearing on this matter the following instructions have been issued from the office of the Director, Division of Traffic, United States Railroad Administration, which are quoted for your information:

"Based upon conference with steamship lines interested in New York, August 13th, there is no objection to accepting prepayment of ocean charges in instances where shippers desire to prepay. There should be no complications in so far as ocean charges on weight cargoes are concerned. There will, however, doubtless be some discrepancies on measurement cargo, and in such instances I have said to steamship lines that we would collect from shippers any undercharges that might be reported back by the steamship lines, we remitting the undercharges to steamship lines as quickly as collection has been made of same from shippers."

A. L. VILES, General Manager.

### RAILROAD MOVEMENT OF LOADED AND EMPTY COAL CARS.

NEW YORK, September 8, 1919.

To the firm members of the Rubber Association of America, Inc.:

Our attention has been directed to the statements of various coal operators that the United States Railroad Administration has failed to provide adequate service for the transportation of coal.

With the thought that this office may be in a position to render some assistance to members who are finding it difficult to obtain coal, because of transportation conditions, we would appreciate very much advice respecting any transportation delay affecting the coal supply of any of our members.

It is quite necessary that this information shall be so well founded that it will be comparatively easy to substantiate any statement made if called upon to do so.

May we not hope for your early attention to this matter?

A. L. VILES, General Manager.

### FEDERAL EXCISE TAX—TREASURY DECISION PLACING BURDEN OF ACCOUNTING FOR TAX ON MANUFACTURER WHO PURCHASES TIRES, INNER TUBES, PARTS OR ACCESSORIES FROM THE MANUFACTURER THEREOF.

NEW YORK, September 6, 1919.

To the firm members of The Rubber Association of America, Inc.:

The attached important Treasury Decision has just been issued by the Treasury Department and reverses previous rulings to the effect that where tires, inner tubes, parts or accessories are sold by the manufacturer thereof to a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and used by the latter other than "in the manufacture or production of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, or for the sale of new automobile trucks, automobile wagons, other automobiles, tires, inner tubes, parts or accessories, or in connection therewith or with the sale thereof, or for free replacement under contract or guaranty," the purchasing manufacturer shall account to the manufacturer of the tires, inner tubes, parts or accessories who shall then account for and pay the tax thereon to the Government.

It will be noted that this decision provides for a revised form of certificate in lieu of the old so called manufacturer's certificate embodied in Treasury Decision 2852, which was enclosed in circular letter of the Association, dated June 5, 1919. The Association believes that it will be unnecessary to obtain this revised form of certificate covering past transac-

<sup>1</sup>Under date of September 11, the Director of Traffic of the United States Railroad Administration advises that through export bills of lading should not be issued on traffic destined to Central America, South America, Africa, East Indies including Straits Settlements, Australia or New Zealand.



tions, where the old form has been procured, but, is, however, taking up this point with the Commissioner of Internal Revenue and will further advise you.<sup>2</sup>

A. L. VILES, General Manager.

<sup>2</sup>A letter dated September 11, from the Association, states that the revised form of manufacturer's certificate embodied in Treasury Decision 2915 need not be obtained with reference to past sales. In other words, where the old form of such certificate, embodied in Treasury Decision 2852, has been obtained in the past, such old form of certificate is sufficient.

#### TREASURY DECISION 2915. EXCISE TAX.

So much of the provisions of Article 14 of Regulations 47, Treasury Decisions 2852, 2860 and 2893, relating to the sale of tires, inner tubes, parts or accessories, to manufacturers or producers of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts and accessories, for sale without further manufacture, modified.

TREASURY DEPARTMENT,  
Office of Commissioner of Internal Revenue,  
Washington, D. C.

To Collectors of Internal Revenue and others concerned:

Article 14 of Regulations 47, entitled "Tires, inner tubes, parts and accessories sold to manufacturers," is hereby modified to read as follows:

Subdivision (3) of Section 900 of the Act exempts from tax, sales of tires, inner tubes, parts, or accessories to a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories. In order for the sale to come within the exemption of the statute, the vendor must also at the time the goods are shipped or sold (whichever is prior) be in his possession an order or contract of sale, with certificate of the purchaser in writing, printed thereon or permanently attached thereto, to the effect that the purchaser is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories; that he is purchasing the articles in question as such manufacturer or producer for resale in some form or manner, or for free replacement under contract or guaranty; and that he will account to the Internal Revenue Collector and pay the tax on the sale of such articles, unless such sales by him are made to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for resale by him in some form or manner or for free replacement, in which case he will require the same form of certificate from such manufacturer or producer; that when such tires, inner tubes, parts or accessories are sold other than on, or in connection with, the sale of new automobile trucks, wagons, automobiles or motorcycles, he will pay the tax on such sales (unless made to a manufacturer or producer, or for free replacement under a contract or guaranty); that when such articles are sold on or in connection with the sale of such new vehicles he will pay the tax on the selling price of such vehicles, including such articles. Said manufacturers furnishing such certificate will be deemed manufacturers within the meaning of the law and subject to the tax imposed on sales of such articles by manufacturers, unless the sales are made to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, for resale by him in some form or manner or for free replacement under a contract or guaranty, and who furnishes a certificate so stating. Following is a form of the certificate or statement which will be accepted and in substance must be strictly adhered to:

#### FORM OF CERTIFICATE.<sup>3</sup>

The undersigned hereby certifies that he is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and that the tires, inner tubes, parts or accessories purchased hereunder are purchased by him as such manufacturer or producer for resale in some form or manner, or for free replacement under contract or guaranty, and agrees if any of the tires, inner tubes, parts or accessories are sold by him except from tax to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for like purpose, he will require a similar certificate from such manufacturer or producer. The undersigned further agrees that in respect to all tires, inner tubes, parts or accessories sold by him, unless such sale is made to such a manufacturer or producer, he will pay the tax on such sale direct to the Internal Revenue Collector, including it in his tax return covering the month in which such sale is made; said tax to be paid on the basis of the taxpayer's selling price of such articles when sold other than on, or in connection with, the sale of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and on the selling price of such vehicles or articles when the same includes such articles.

If it is impracticable to furnish a certificate for each order, a certificate covering all orders between given dates (such period not to exceed a month) will be accepted. If in any case such an order and certificate cannot be produced on demand of any authorized agent of the Department, the tax in respect to the sale will be considered in default.

So much of the provisions of Regulations 47, Treasury Decisions 2852, 2860 and 2893, as relates to the sale of "tires, inner tubes, parts or accessories" are, in so far as they conflict herewith, hereby revoked.

J. H. CALLAN, Acting Commissioner of Internal Revenue.

Approved September 3, 1919.

CARTER GLASS, Secretary of the Treasury.

<sup>3</sup>A letter dated September 13, from the Association, stated that the certificate outlined in Treasury Decision 2852 or 2915 will be accepted on sales between May 1 and August 31, 1919, but the certificate outlined in Treasury Decision 2915 must be used on sales on and after September 1, 1919.

#### NORTHWEST LAKE AND RAIL SHIPMENTS.

NEW YORK, September 12, 1919.

To the firm members of The Rubber Association of America, Inc.:

As a matter of information and to supplement your Traffic Department files, we are enclosing herewith a copy of circular<sup>4</sup> issued by the Great Lakes Transit Corporation, setting forth the advantages of forwarding shipments to the Northwest via the rail and lake routes of that line as compared with the rates via all rail.

In this connection we also call your attention to the fact that rates via rail and lake also include insurance while the shipments are on board boats of the lake line.

A. L. VILES, General Manager.

<sup>4</sup>Copy of this circular may be obtained from the Association.

#### THE FIFTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

THE FIFTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES was opened in Chicago, September 22, at the Coliseum and the First Regiment armory, and continued during the week. It is the most comprehensive exhibition of chemical and allied products that has ever been shown, making plain to the general public the great advance made by American chemists during the war years, especially in those lines in which Germany previously was preeminent.

Holding the exposition in the Middle West has stimulated interest and resulted in several professional associations holding their annual meetings in Chicago, to enable them to examine the display. Among these are the American Institute of Mining and Metallurgical Engineers, the American Electro-Chemical Society, the Technical Association of the Pulp and Paper Industry and the American Ceramic Society.

Many of the exhibitors naturally are connected with the rubber industries. We may note among them:

THE AMERICAN HARD RUBBER Co., New York City, with a display of hard rubber centrifugal and reciprocating pumps.

THE FOAMITE FIREFOAM Co., New York City, apparatus for fire protection in oil and chemical plants, including the automatic sprinkler.

WERNER & PFLEIDERER Co., Saginaw, Michigan, rubber solution and cement mixers, rubber washers and mixing machines.

THE BRISTOL Co., Waterbury, Connecticut, pressure gauges, measuring and electrical instruments.

THE BUFFALO FOUNDRY & MACHINE Co., Buffalo, New York, vacuum dryers.

DAIGGER & Co., Chicago, Illinois, laboratory supplies and new chemical products.

J. P. DEVINE Co., Buffalo, New York, vacuum dryers, kettles, pumps.

GENERAL ELECTRIC Co., Schenectady, New York, a model of precipitation outfit, motor with acid resisting insulation, other innovations and improvements in electrical machinery.

THE HUNTER DRY KILN Co., Indianapolis, Indiana, humidity dryer.

NATIONAL ANILINE & CHEMICAL Co., New York City coal tar stuffs, intermediates and food colors. More than 200 distinct dyes of American manufacture.

NEW JERSEY ZINC Co., New York City, zinc products and other chemicals.

SCHAEFFER & BUDENBERG, Brooklyn, New York, pressure gauges, other recording instruments and testing apparatus.

C. J. TAGLIABUE MANUFACTURING Co., Brooklyn, New York, controllers and recording machinery.

TAYLOR INSTRUMENT Co., Rochester, New York, temperature and humidity measuring instruments.

WESTINGHOUSE ELECTRIC & MANUFACTURING Co., East Pittsburgh, Pennsylvania, electric apparatus applied to chemical industry.

BOYER OIL Co., New York City, seeds and nuts with the oil expressed from them, cake and meal.

J. H. DAY Co., Cincinnati, Ohio, mixing and grinding machines.

INNIS, SPEIDEN & Co., New York, chemicals.

PRODUCT SALES Co., Baltimore, Maryland, glue, cement, chemicals, sponges, asbestos.

WHITALL TATUM Co., Philadelphia, Pennsylvania, chemical glassware and laboratory apparatus.

A SIMPLE METHOD RESORTED TO IN GERMANY FOR RENDERING PERISHED RUBBER STOPPERS SERVICEABLE consists in turning off the hardened external portion in a lathe and finishing the surface with sandpaper. The hardened surface of a boring through the stopper is similarly removed by a round file.

## Hevea Confusa in Singapore.

A TREE which has been determined as *Hevea confusa*, Hemsl., has been discovered in the Economic Garden of the Singapore Botanic Gardens and recently destroyed to prevent cross-pollination with seed-bearing *Hevea brasiliensis* trees nearby. I. H. Burkill gives a very complete botanical description of this species in "The Gardens' Bulletin, Straits Settlements," of July 4, 1919, accompanied by an excellent photograph.

The history of the tree was unrecorded, but its dark gray bark attracted attention; its foliage was seen to differ from that of *Hevea brasiliensis*, likewise its flower. The seeds were small, though not outside the extraordinarily wide limits in which *Hevea brasiliensis* varies. On tapping, the latex was found to be yellow, meager in amount, and to remain tacky, with little elasticity.

Dried flowering specimens sent to the Royal Botanic Gardens, Kew, were determined as *Hevea confusa*, Hemsl., by Sir David Prain. Samples of the rubber submitted to Dr. Frankland Dent, government analyst, Straits Settlements, and to B. J. Eaton, agricultural chemist in the Department of Agriculture, contained about 95 per cent of a substance chemically rubber, but lacking the physical properties required in commercial rubber, probably, Mr. Eaton suggests, a polymer of caoutchouc. Rather under two

acute, as in *Hevea brasiliensis*. The female flowers are a little smaller and the male flowers considerably smaller than those of *Hevea brasiliensis*, but a still more striking difference is the pose of the male flowers. The panicles are narrower than those of



HEVEA, HYBRID, TRINIDAD.



HEVEA CONFUSA, 1910, TRINIDAD BOTANIC GARDENS.

per cent of resins was contained. The tree yielded so grudgingly that the samples were too small for a vulcanization test.

Burkill describes *Hevea confusa* as belonging to the section of the genus which has the male flower buds blunt rather than

*Hevea brasiliensis*, as much because the angle at which the side axes take off is smaller, as because they are of lesser size. The weakest panicles are wholly male, as in *Hevea brasiliensis*, and the stronger carry more and more female flowers upon the lower side branches up to 5 or 6. The perianth lobes are ovate and blunt, and the cup extends to half their length; they and the cup are straw colored with a magenta line down the middle from the tip or near it to the very base inside. Outside they are covered with short hair. The top of the ovary is conspicuously blunt with sessile stigmas. The male flowers are blunter than those of *Hevea brasiliensis*, straw-colored, have fewer anthers, and by the bending of their pedicels they face more or less earthwards. Outside they are hairy. This bending of the pedicels gives a very good distinguishing mark which the herbarium student cannot note so well as the field student.

*Hevea confusa* originates from British Guiana. It differs as little from *Hevea pauciflora*, Muell. Arg., of the same region, that to unite the two on botanical eye characters is quite justified, and it is not surprising that with only the seeds as a guide Dr. P. J. Cramer suggested *Hevea pauciflora* as the species. *Hevea pauciflora* is known to produce hybrids of no apparent value with *Hevea brasiliensis*, and that the same is true of *Hevea confusa* is shown by the experience of planters in Trinidad.

During the winter of 1911-1912 the Editor of THE INDIA RUBBER WORLD visited a plantation owned by Boston rubber manufacturers, where many *confusa* hybrids were found among true *Hevea brasiliensis*. The source of the seed from which these trees grew was a fine thirty-year *Hevea brasiliensis* of undoubted purity, growing in the Botanic Gardens of Port of Spain. About one hundred feet from it was an equally large and thrifty *Hevea confusa*. The theory, therefore, is that bees visiting the flowers of *Hevea confusa* conveyed pollen to the flowers of the *Hevea brasiliensis*, and thus were responsible for the creation of a troublesome mongrel. That it was discovered while planting

was still young in the western world is most fortunate, and Mr. Burkill deserves a vote of thanks from all *Hevea* planters for being so keenly alive to the importance of keeping this species and its hybrids out of the plantations of the Middle and Far East.

As found in Trinidad, the *Hevea* hybrids were of lusty growth, full-branched and densely leaved. The leaves were much broader toward the point than those of *Hevea brasiliensis*, the leaves of hybrid seedlings standing out from the stem almost horizontally and those of *Hevea brasiliensis* hanging almost vertically. The bark was of dark reddish color rather than of the usual silvery appearance, and hardly more than an eighth of an inch in thickness. The surface of the outer bark was broken by many minute spines; whereas, the bark of *Hevea brasiliensis*, although nearly smooth, shows tiny vertical ridges. The latex produced a rubber that was very short and far inferior to fine Pará. After the latex had ceased flowing, a yellow-green resin oozed out and rolled down over the bark and there remained as sticky as the surface of fly-paper.

#### CAPTAIN BUCKLETON VISITS GERMAN RUBBER FACTORIES.

CAPTAIN ERNEST E. BUCKLETON, president of the Northwestern Rubber Co., Limited, Liverpool, England, has recently returned from an extensive tour of the leading rubber factories of Germany. He was the first business man from an Allied country to visit Germany after the armistice was signed, and of course the first in the rubber industry. The trip was exceedingly interesting in that it gave him a good opportunity to learn from the heads of the largest concerns the condition of the German rubber industry during the war and at present.

Regarding his findings Captain Buckleton writes as follows:

I found that all of the factories were working at fullest capacity, the government favoring small factories which, up up to the starting of the war, were in very low water, but in the past five years have improved their condition. In fact, all of them have made considerable money and relatively are in a very sound position.

During the period of the war, the manufacturers of Germany did not suffer to any great extent from want of fabrics, the government having absolute control of this material and apportioning it out to the industries where it was most needed. What they suffered from mostly was want of crude rubber and oils, as their stocks, when war was declared, were very low. Prohibitive prices, as high as \$7.50 per pound were paid for crude rubber, when it could be found. A substitute made from coal and chalk was produced by the Elberfelde Co. and marketed as "synthetic rubber," the price of this material averaging about \$3.60 per pound.

The use of reclaimed rubber during the war was considerably increased, and the product turned out was very good, the price, however, being very high.

The working conditions in the factories, from what I could learn, were about the same as in all other Allied countries in Europe during the war period, and the conditions today about the same. The average mill man earns about 55 to 60 cents per hour, but the output is only roughly three-quarters of normal.



CAPTAIN ERNEST E. BUCKLETON.

The highest prices paid for various materials in Germany during the war period are as follows:

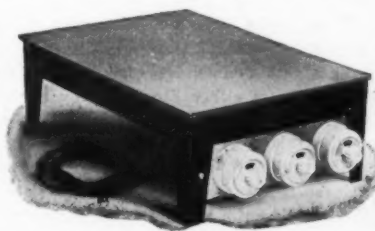
ARTICLE.	DATE.	PRICE PER POUND.
Aniline .....	February, 1915 .....	\$1.52
Caustic soda .....	July, 1919 .....	4.36
Ammonia solution .....	October, 1918 .....	.50
Caustic soda lye .....	June, 1919 .....	.46
Caustic potash lye .....	December, 1918 .....	.56
Caustic potash, 90 per cent. ....	June, 1918 .....	.98
White lead .....	March, 1917 .....	2.72
Litharge .....	September, 1917 .....	4.29
Natural pumice .....	May, 1916 .....	.13
Benzol .....	July, 1919 .....	1.33
Cylinder oil .....	April, 1916 .....	4.20
Chloride of sulphur .....	July, 1915 .....	.43
Ceresin .....	July, 1917 .....	8.67
Bleaching powder .....	June, 1919 .....	.81
Rosin .....	August, 1915 .....	1.74
Resin .....	February, 1916 .....	1.14
Calcium carbide .....	May, 1918 .....	3.16
Brown factice, best .....	July, 1919 .....	1.09
Brown factice, ordinary .....	March, 1919 .....	1.03
Prime rape-seed oil factice .....	April, 1917 .....	1.52
Varnish substitute .....	June, 1919 .....	1.47
Flake graphite .....	October, 1918 .....	1.09
Gypsum .....	May, 1918 .....	2.59
Graphite .....	April, 1918 .....	.84
Golden sulphuret of antimony .....	September, 1918 .....	8.20
Golden sulphuret of antimony .....	July, 1915 .....	3.05
Powdered glass .....	April, 1919 .....	.38
Rosin oil .....	May, 1916 .....	2.62
Hydrate silica of aluminum .....	November, 1916 .....	.065
Common chalk .....	March, 1916 .....	.018
Refined chalk .....	October, 1918 .....	.24
Lime .....	May, 1919 .....	.17
Linseed oil .....	August, 1915 .....	2.09
Carbonate of magnesia, heavy calcined .....	November, 1915 .....	.40
Mineral rubber .....	February, 1918 .....	1.03
Machine oil .....	April, 1919 .....	2.29
Olive oil .....	April, 1919 .....	2.07
Soft soap .....	December, 1918 .....	5.66
Olein soap .....	March, 1916 .....	3.54
Petroleum (kerosene) .....	July, 1919 .....	.54
Carbon black (lamp black) .....	March, 1915 .....	2.40
Muriatic acid .....	February, 1919 .....	1.66
Rectified spirit .....	July, 1919 .....	2.12
Soda .....	May, 1919 .....	.28
Sulphur .....	July, 1919 .....	1.66
Carbon bisulphide .....	March, 1916 .....	1.63
Barytes .....	February, 1919 .....	1.03
Sulphuric acid .....	November, 1918 .....	.12
Zinc sulphide .....	November, 1914 .....	.63
Talc .....	March, 1917 .....	.35
Turbine oil .....	May, 1919 .....	3.27
Carbon tetrachloride .....	May, 1919 .....	3.60
Zinc oxide .....	June, 1919 .....	2.86
Cinnabar .....	July, 1915 .....	8.18
Zinc dust .....	February, 1918 .....	1.36

#### EXPORT CONCERN TO DEVELOP SOUTH AMERICAN TRADE.

The Namusa South American Co., with temporary offices at 30 Church street, New York City, has been organized by a group of manufacturing concerns in the United States for the development and maintenance of export trade under the Webb-Pomerene Act. The plan under which the corporation will operate is sponsored by the National Association of Manufacturers.

#### ELECTRIC HOT-PLATE.

The Hoskins electric hot-plate for laboratory use has a heating element of the three-heat type made of chromel wire, producing 475, 600 and 750 degrees F. The heating unit is composed of three parallel windings of chromel wire which can be very easily renewed. It operates on 110 or 220 volts, alternating or direct current. (Hoskins Co., Detroit, Mich.)



THREE-HEAT TYPE PLATE.

Holmes Brothers, makers of rubber machinery, have moved to 440 North Sacramento Boulevard, Chicago, Illinois.



## The Rubber Trade in Great Britain.

*By Our Regular Correspondent.*

**T**HE ECONOMIC PROBLEMS arising from the external debts contracted by all the countries recently at war—leaving America out of consideration—have come somewhat as a shock to those who had not anticipated anything of the sort. In the case of raw rubber the idea was that the European countries would send rush orders for large quantities and that the price would jump. The reality is that there is very little money anywhere to pay for imports and the arrangement made whereby long credits are allowed to the new states by the British Government is not considered an ideal one by the taxpayer who will have to shoulder any losses that accrue.

The fact that all import restrictions were removed on September 1 is not hailed with glee by manufacturers generally, despite the precautions which are to be taken to prevent the dumping of goods from a foreign land at a cost which is beneath the price at which they are sold in their own country. Those who wanted a tariff on all imported goods which are being made in this country are especially dissatisfied, though the consumer, of course, looks at things in a different light. At the time of writing it is too soon to say how the protection to be afforded to "key industries" will affect the rubber trade but it will not be a matter of great concern because, except in a few articles, we have always been an exporting rather than an importing nation in rubber goods. With regard to the profiteering bill, we may expect to see some reduced prices in the retail shops, especially in country districts and at the seaside where a good deal of profiteering has been going on in rubber goods.

A prominent proofing firm tells me that as regards its production probably the annual import of goods does not exceed \$1,000, so there is nothing to fear from foreign competition. On the subject generally he expressed himself as in favor of competition as being conducive to progress. Makers of sand shoes and gymnastic shoes who have had in the past a good deal of competition from America and Germany, are wondering what Germany will do in the way of exporting on the removal of restrictions. Their goods were cheaper than ours, but not better, while as regards goloshes, it is reluctantly recognized that we are still in the position of having to meet a better article, if public preference is a safe guide.

### **NAPHTHA STORAGE.**

Developments of some interest are now taking place in regard to this matter, which is closely connected with the storage of petrol and benzol in motor garages. In small rubber works it has been customary for the solvent naphtha to be drawn direct from the cask or drum as required, thus often leading to the inclusion of some water and sediment. In the larger works cast iron longitudinal tanks are used, capable of holding many thousands of gallons. These tanks have riveted covers and a sloping bottom where the water and sediment collect. A float attached to an index scale shows the volume of solvent in the tank at any time. The naphtha is either drawn off by a cock above the water line by hand or is pumped to the dough-mixing rooms. In this system there is a certain, though only small loss by evaporation and the tank contains an explosive mixture of air and vapor. At least this is what is generally stated, though I should have thought that the amount of vapor present would have been above the explosive limit. I have never heard of the explosion of a naphtha tank due to the ignition of this explosive atmosphere by lightning, though it is spoken of as possible. In the Bywater system of hydraulic storage the method adopted is to displace the liquid in storage by water, thus leaving no space for evaporation. No pumps are used, labor costs being thus reduced to a minimum as the water does all the work.

Briefly stated, the hydraulic system consists of a steel tank in

which the liquid is stored. On delivery into the tank the liquid displaces a like quantity of water, which, being registered through a meter, measures the volume of solvent entering the tank. On the solvent being drawn off through another meter the water reenters the tank, to take its place. Plans have been worked out for utilizing the system in proofing factories, the naphtha being raised to the necessary level and run by piping to the several floors, a meter being fixed at each point of delivery, thus checking the exact amount taken by each machine. Although the hydraulic system has been adopted mainly for the storage of petrol for motor purposes, it has also been installed by two of our largest proofing works, the capacities being 10,000 gallons and 6,000 gallons. As the storage tank is usually sunk into the ground there is no tendency to float on swampy ground as it is always full of liquid.

Reverting to what I said about not having heard of the explosion of a naphtha storage tank, it may be of interest to say a word in regard to what appeared in the papers recently. This was to the effect that a certain casualty was due to the explosion of a naphtha tank at the rubber works of I. Frankenburg & Sons, Limited, of Greengate, Manchester. In reality this was not the explosion of a storage tank. The tank in question was a small service tank in one of the spreading rooms, the naphtha in which got alight from some unascertained cause, possibly the bursting of an electric light globe.

### **NEW WORKS.**

Potter's Asbestos Co., Limited, Littleborough, Lancashire, is about to build a rubber works which will give employment to 1,000 hands. A housing scheme is to be put in hand by the local district council in order to provide for the influx of work people. Littleborough is only a few miles away from Rochdale, where the important asbestos plant of Turner Bros. is situated, and there is no regular rubber works in the district.

It is understood that Redfern's Rubber Works, Limited, Hyde, near Manchester, has decided to erect a new factory at Crewe, the well known railway center of the London & North Western Co.

The Standard Tyre and Rubber Manufacturers, Limited, has been formed with a capital of £125,000, to take over the rubber manufacturing business carried on at Alperton Mills, Wembley, near London.

The British Westinghouse Co., located in Trafford Park, Manchester, is to be known in the future as the Vickers Electrical Co., Limited. It was reported recently that Vickers, Limited, had obtained a controlling interest in Glovers Cable Works, situated only a few hundred yards from the Westinghouse works.

### **MAGNESIA.**

In the course of one or two legal actions regarding the sale of magnesium carbonate, it was made evident by the varying statements of experts that there is still a good deal to be found out about the molecular constitution of the basic magnesium carbonate, so largely used in the rubber trade. Judging from the remarks of some chemists and their constant reference to the Pharmacopoeia, it seems that the large tonnage used in the rubber trade is not generally recognized and it is no doubt correct to say that no other industry uses it on a like scale. Outside purely legal questions as to the validity of contracts there has been a good deal of evidence given as to the difference between light and heavy carbonate of magnesia and also as to the presence of certain impurities, such as sulphate of soda. Despite the fact that analyses may show practically identical figures in the case of light and heavy, it requires very special pleading on the part of counsel to contend that they are the

same thing when the volumes occupied by the same weight of each are compared.

To the best of my knowledge rubber manufacturers who buy light carbonate of magnesia lay far more stress upon the lightness than upon any other attribute. Indeed, I doubt if any of them ever think about the degree of hydration or the linking of the hydroxyl groups. An eminent counsel declared that there must be some point at which light magnesia merges into heavy and that in the case of such a product it would be impossible to specify or identify it as light or heavy. Scientific evidence, however, has been given that light and heavy have different and distinct characteristics and that there is no such thing in commerce as a half and half product. It occurs to me here that there would be no difficulty in making up a mixture of the two if there was any demand for it and a dispute on a product of this sort would be a thorny matter to tackle.

With regard to the presence of sulphate of soda in magnesia made by the precipitation process, I do not know that there are any permissible limits recognized in the British rubber trade. This probably arises from the fact that attention has not been called to the point owing to the great bulk of the magnesia used in pre-war days being the product of a special process in which sulphates are not employed.

As to the use of the light and heavy in the rubber trade for bulk compounding, evidence goes to show that the light is almost generally employed whereas the heavy has but few adherents. Whether this preference is based on solid grounds is a matter which does not call for detailed discussion here. With respect to the use of small amounts as an accelerating agent I believe the general opinion is that the two work equally well.

It is interesting to note that a natural basic carbonate of magnesia having the same chemical composition as the manufactured article has been found in places in Canada and I believe that a consignment has been shipped to England.

Normal carbonate of magnesia, or magnesite, is, of course, comparatively common in the world and in the finely ground state it is said to be used to some extent in the rubber trade. As there is no recognized standard for light and heavy basic carbonate of magnesia, and as some makes of light are heavier than other makes of light, it certainly seems desirable that all contracts or rates should be by sample so as to obviate the possibility of disputes on delivery.

#### THE RUBBER TRUST'S HEAVY LOSS.

The report of the Rubber Plantations Investment Trust explains why the shareholders will have no dividend for the second year in succession, though it indicates that a better result may be expected for the present year. The balance at the end of March, 1918, was £119,375, the whole of which was carried forward. In 1918-1919 there was a net loss on the produce from the company's estates of £106,020, reducing the balance to 3,300, which naturally does not permit the payment of a dividend. The report contains the cheering assurance that the adverse war conditions have now been largely removed and that the intrinsic value of the trusts' investments, both in shares and properties, has largely appreciated—a valuation of the investments in shares, debentures, and options made at the end of last March, shows a surplus of £4,289,927 over the £815,647 at which they stand in the balance sheet. In 1910-11 the dividend paid was 15 per cent.

## Miscellaneous Foreign Notes.

#### FEDERATION OF BRITISH INDUSTRIES INCLUDING RUBBER.

THE Federation of British Industries comprises 172 associations and 956 individual firms, representing upward of 17,000 British manufacturing establishments. A plan of organization has been outlined under which the various industries are divided into 17 groups.

The rubber industry is placed under group 13, which consists of rubber, asbestos, leather and allied trades. The following list of sections in the group will make the system more clear:

- Group 13. Rubber, asbestos, leather, and allied trades:
  - Subgroup 1. Rubber Manufacture—
    - (a) General rubber trade.
    - (b) Tire trade.
    - (c) Proofing and garment making.
  - 2. Leather production—
    - (a) Curriers and light leather manufacture.
    - (b) Tanning and heavy leather manufacture.
  - 3. Leather-goods manufacture—
    - (a) Saddlery and harness.
    - (b) Boot and shoe manufacture.
    - (c) Leather belting.
    - (d) Bags and fancy goods.
    - (e) Balata belting.
  - 4. Asbestos manufacture—
    - (a) Textiles, etc.
    - (b) Asbestos cement (building materials).

#### C. D. LLOYD RETIRES FROM THE VICTORIA RUBBER CO.

C. D. Lloyd, for 35 years with The Victoria Rubber Co., Limited, Edinburgh, Scotland, was presented with a gold watch and purse of Treasury notes from the staff and employees on August 14, 1919, when he retired. J. E. Baber, manager of the works, made the presentation speech in the absence of P. M. Matthew, managing director, commenting on the fact that a number of other members of the staff have been 30 years or more with the company, and emphasizing the spirit of cooperation in the past between the company and its employees as the ideal to be especially striven for in industry at the present time.

#### DISTINGUISHED SERVICE MEDAL FOR CAPTAIN ALCAN.

Captain Adrien Alcan, a partner in the firm of Alcan & Co., rubber merchants of Paris, France, associated with Hecht, Levis & Kahn, London, England, who for two years has been attached to American Army Headquarters in France, was recently awarded the Distinguished Service Medal by General Pershing in the name of the Government of the United States, with the following text:

While on duty with the French Military Mission at General Headquarters, American Expeditionary Forces, he rendered services of exceptional value to the United States Army. His ability, tact, loyalty, and untiring efforts proved of inestimable assistance in the successful execution of many important negotiations with the French Army. He went far beyond the bounds of duty to help the American Expeditionary Forces, proving himself a willing and devoted friend to their interests.

#### SOCIETE INTERNATIONALE DE PLANTATIONS ET DE FINANCE.

The *Société Internationale de Plantations et de Finance*, a joint stock company with 25 million francs capital, aims to promote the plantation industry, especially the culture of rubber, olive trees, tea and coffee, in the various European Colonies in Asia, and the financing and administration of the plantations already in existence or those to be established.

Various well-known persons in financial and plantation circles in Belgium, The Netherlands, France, England and Switzerland are members of the board of directors. For the Netherlands they are the Messrs. J. F. van Tienhoven, K. P. van der Mandele, C. J. den Tex Bondt, O. F. Weise and A. G. N. Swart, the latter as a member of the Committee of Direction. The main office is at Antwerp, Belgium, and a branch office will be opened at 's-Gravenhage (The Hague), Holland, while in Sumatra, Medan, the Federated Malay States agencies are being established.

**A DANISH CABLE FACTORY.**

Early in the war Denmark decided to make its own cables and the *A. S. Den Danske Kabelfabrik* was formed in the fall of 1916, exclusively with Danish capital. By the end of 1917 the buildings were ready at Fredericksholm Haven, Copenhagen, and work was begun in the wire-drawing mills. However, machinery ordered in America was held back, so Danish engineers were employed to exercise their ingenuity in constructing the necessary machinery, which is said to be satisfactory.

**RUBBER IMPORTS AND EXPORTS.**

Official statistics show Danish rubber imports and exports for the following years to be:

	Imports.			Exports.		
	1913.	1917.	1918.	1913.	1917.	1918.
Crude ..... pounds	253,660	289,280	22,980			
Manufactured .....	2,227,720	1,107,920	135,080	168,960	.....	.....

**AKRON TIRES IN AUSTRALIA.**

Charles Duval, manager of tire sales for The B. F. Goodrich Co. in Australia, states that 65 per cent of the tires used on automobiles in that continent come from Akron factories, and believes that the market for American tires and rubber goods will materially increase in Australia in a few years. Motoring is much more expensive there than in America, gasoline averaging 85 cents per gallon and automobiles costing approximately twice as much as in the United States.

**COOPERATION OF JAPANESE RUBBER COMPANIES.**

A further development of Japan's increasing rubber trade is looked for through a combination of large and small rubber factories in and near Tokyo that is said to portend amalgamation at an early date so as to put the Japanese rubber manufacturing industry on a firm foundation. This was brought about by the receipt of large orders for rubber tubing and sheeting from the new Siberian Government that the Okuragumi has distributed among the Mitado, Toyo, Nippon and Meiji companies, regarded as having the best rubber works aside from foreign enterprises in Japan. This form of co-operation, involving the exchange of orders and stocks, has been decided upon to secure efficiency and economy, and to avoid unnecessary competition among local firms.

**ANALYSIS OF ITALIAN RUBBER TRADE.**

ITALY'S TRADE in rubber and rubber manufactures in 1913 amounted to \$11,543,217 in imports and to \$9,861,147 in exports. Of the former amount, imports of crude rubber accounted for \$4,940,549 and of tires for \$4,393,742. Tires were the largest item of exports, being valued at \$7,927,379. The imports in 1917 were valued at \$17,523,941, raw rubber accounting for \$13,008,046, and tires for \$2,130,257. Exports for that year were valued at \$6,541,938, tires, the chief item, amounting to \$4,829,323, and raw rubber to \$299,787. In 1918 the value of the imports increased to \$19,805,933—raw rubber being valued at \$16,019,097, and tires at \$1,050,885—and the exports decreased to \$3,150,291—tires being valued at \$2,090,248.

The Italian trade in rubber, gutta percha, and manufactures thereof is very small, the normal consumption within the country being about 2,000 tons per year outside of imported rubber overshoes. Practically all the raw material brought in is used by one company whose name is almost synonymous with rubber tires. Several other firms, however, manufacture rubber goods. Exports of tires have exceeded imports for some years, being, in 1913, 3,012 tons; in 1914, 4,114 tons; in 1915, 4,361 tons; in 1916, 3,778 tons; in 1917, 2,117 tons; and in 1918, 916 tons. Of the 1913 exports, which can be taken as representing normal con-

ditions, 888 tons went to Belgium, 587 to Switzerland, 403 to Great Britain, 352 to Germany, 270 to Austria-Hungary, 134 to Argentina, 97 to France, and 64 tons to Australia. The largest customers for Italian rubber goods outside of tires, particularly for small tubes and elastic, were Argentina, Brazil, Cuba and Uruguay, which, with other Latin American countries, probably took two-thirds of all exports. Most owners of good automobiles prefer imported tires, which they consider superior to those of Italian manufacture. The market is not, however, extensive, as the number of cars is small.

The importation of rubber overshoes, which particularly interests American manufacturers, who have had control of this market for many years, shows a decided tendency to decrease. Imports in 1908 amounted to 135,856 pairs; in 1909, to 159,168; in 1910, to 173,747; in 1911, to 201,824; in 1912, to 121,565; and in 1913, to 43,588 pairs. The present fashion of women wearing high-heeled slippers or low shoes for street wear in winter makes the use of rubber overshoes, except sandals, impracticable. Efforts should be made to encourage the trade in an overshoe designed for such wear.—("Commerce Reports.")

**NEW PIRELLI MANAGERS.**

Pirelli & Co., of Milan, Italy, announce that the following have been added to the personnel of the board of management, any two of whom together may sign for the firm: Federico Artom, Rizzieri Campiglio, Luigi Crosio, Dr. Mario Lubbatto and Giuseppe Venosta. These are in addition to Roberto Comelli, Carlo Fratino, Fabio Palandre and Lorenzo Ramelli, who were already on the board.

**RUBBER GOODS REQUIRED BY ITALY.**

Among the various goods required by Italian merchants who desire to sell on a commission basis are crude rubber, rubber shoes, rubber heels, fountain pens, etc.

American manufacturers who contemplate entering the Italian market should send samples either to a forwarding agent or to the American Chamber of Commerce in Milan. If notified where samples may be inspected, this consulate will gladly forward such information to interested parties in its district (Lombardy).

Other suggestions are: (1) Catalogs and correspondence should be in Italian or French. (2) When possible, price should be quoted c. i. f. Genoa, in Italian lire and metric measurements. (3) When quotations are f. o. b. American ports, there should be added the exact freight rate to Italian ports, in order that the prospective purchaser may know how much the goods will cost him delivered in Italy.

**RUBBER EXPORTS FROM THE NETHERLANDS.**

The *Vereniging voor den Rubberhandel* (Society for the Rubber Trade) at Rotterdam, Holland, has forwarded a despatch to the Minister of Agriculture, Industry and Commerce, urging the removal of the export prohibition on crude rubber. Now that imports are free and there are no difficulties in obtaining crude rubber, it is in the interest of the plantation companies, and also for the restoration of the staple market, that rubber exports should be free.

**AMERICAN VESSELS CARRYING CRUDE RUBBER TO THE EAST INDIES.**

The interest now being manifested in the development of the trade between America and Java is shown by the fact that two large American cargo vessels recently sailed from Soerabaya on the same day, after discharging general cargo from America. One of these vessels is carrying direct to New York via the Suez Canal a full cargo, including crude rubber from Soerabaya, Samarang and Batavia.



## A Rubber Letter from Germany.

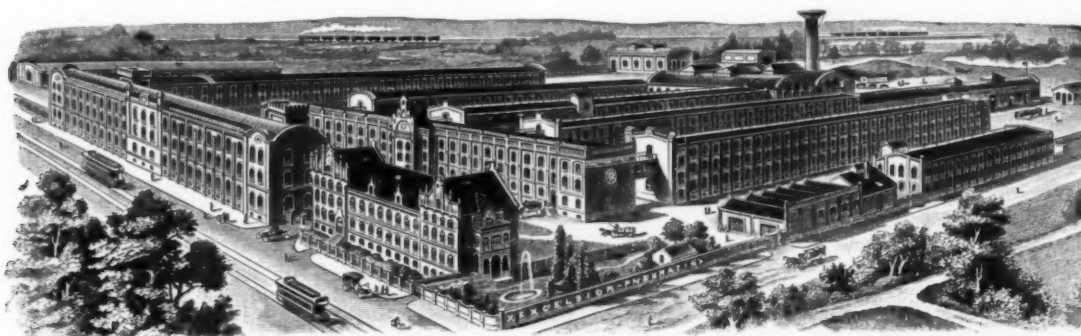
*From a Well-Known German Technologist.*

THE WAR with its horrors is over, a new period of peace has begun. The campaign on the border came to an end as early as November, but the political and economic strife in the interior continues with undiminished energy even to-day. When will the real resurrection from the frightful cataclysm come about? Let us only hope that a dam may be built against the Bolshevik flood, that all-destroying terror which is far too greatly underestimated by you over there, but is far more dangerously menacing than you apparently think.

As a token of the difficult conditions with which the German rubber industry had to wrestle during the war the words "no crude rubber" will suffice. That tells the whole story. And while they succeeded during the period of the war in supplying the German textile factories with great quantities of domestic fibers for the most varied purposes, such substitutes were cut

	Dividends, Per Cent.
C. Müller Gummiwarenfabrik, Berlin.....	7½
Vereinigte Gothania Werke, Gotha.....	10
Norddeutsche Gummi- und Guttaperchawaarenfabrik, Berlin...	15
Phil. Penin Gummiwarenfabrik, Leipzig.....	25
Gummiwerke Fulda .....	10
Vereinigte Berlin-Frankfurter Gummiwarenfabriken.....	15
Leipziger Gummiwarenfabrik, vorm. Julius Marx, Heine & Co.	5
Gummiwerke Elbe, Hamburg .....	13

The prospects of the German rubber industry in the current business year are looked upon naturally with skepticism, for to-day there is lack not only of crude rubber, but also of oil and coal as well as other working materials. The loss of the world war and the upset it involves have hit hard the German rubber industry also, and no one can tell what is going to happen, for the factors on which the coming development depends are too many—the phantom of socializing business, continuous unrest, steady wages agitation and strikes, labor demands that cannot be granted, business expenses, payments and



FACTORY OF THE HANNOVERSCHES GUMMI-KAMM COMPAGNIE, A. G.

off from the rubber industry. Certainly we must not forget to mention that the preparation of artificial rubber was undertaken on a large scale during the war, and considerable quantities of this synthetic rubber were worked up by the rubber factories. It should be made clear in America that the veil which for a long time was wrapped about the creation of artificial rubber has been lifted. It is certain that the artificial rubber has done good service to Germany during the war years. Now it has again sunk out of sight, at any rate for the immediate future, since the German rubber goods factories are declining to take further quantities of synthetic rubber the moment sufficient quantities of the natural product are imported. As to what will become of the great works built to manufacture the artificial rubber, no light as yet has penetrated the darkness that covers the riddle.

I have before me a number of commercial reports of German rubber factories for the working year 1917-18. We find from these that the factories, in spite of the deficiency in crude rubber and the enormous difficulty of procuring other necessary raw material and stuff to work, were kept fully busy with the manufacture of the articles needed by the army administration and for economy purposes, and in general were not cut down seriously. It must be taken into consideration, however, that these figures show hardly or not at all the effects of the revolution in the last account. Following are the latest dividends paid by a series of standard enterprises:

	Dividends, Per Cent.
Continental Caoutchouc & Gutta Percha Co., Hanover.....	30
Mitteldeutsche Gummiabrik Luis Peters, Frankfurt am Main...	14
Asbest und Gummiwerke Alfred Calmon, Hamburg.....	20
Hannoversche Aktien Gummiwarenfabrik.....	30
Mannheimer Gummi- Guttapercha und Asbestfabrik.....	11

taxes that have risen enormously, the cessation of exports and the importation of manufactured goods from foreign lands, the inability to compete and the speculation in the markets of the world. All these things press down upon business measures and circumstances call for an entirely new internal and external organization.

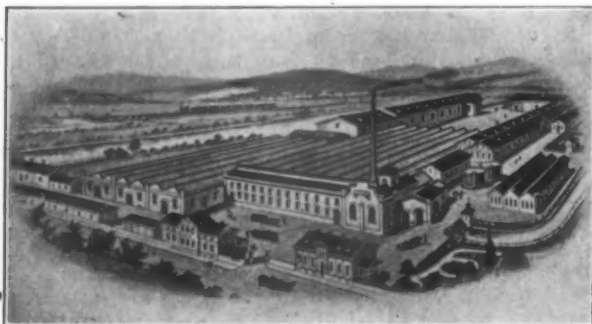
The Continental Rubber Co., Hanover, expresses the following opinion regarding the future: "We most seriously fear that we shall not be capable of competing in the world markets, and that even at home as soon as our boundaries are opened, we shall hardly be in a position to protect ourselves against foreign competition. However, it rests with us Germans ourselves how we lay out the future. We need quiet imperatively. If lasting peace returns to us, then we may well hope that raw materials will not be withheld and that with them labor will be provided for, because work, the hardest, most strenuous kind of work, is necessary if we are to recover and not go to destruction."

A few days ago the importation of crude rubber was permitted and thereby a "first pebble of resistance" was moved out of the way. The important question remains open, however. When shall we receive sufficient quantities to enable us to get manufactures into full swing? We know that there is a clear overproduction of plantation rubber, that therefore great supplies are to be had at low prices. How is it, however, with transportation to European markets? The war has brought about a complete change in the rubber market. We are, in the first place, still wholly dependent on London. And here we come to a point that interests in an unusually high degree the German circles that are concerned; it is the development of the American rubber and automobile industry, the investment of

American capital in East Asiatic rubber plantations and all that that implies. What America has accomplished in this line is really astounding, and the manner in which she has managed to utilize the war conditions that were favorable for this. Germany may, perhaps, be the chief sufferer, but the fact remains that it admires what America has been able to accomplish.

We have lost our colonies, can no more raise our own rubber; our manufacturers have neglected to invest large amounts of capital in the East Asian rubber plantation form of agriculture, and our Hamburg crude rubber market, erected only a little while before the war, is ruined.

As to the future of our market in Hamburg, that is obscure. May the words of M. A. Ritter receive the attention which



VEREINIGTE BERLIN-FRANKFURTER GUMMIWAREN FABRIKEN  
(GELNHAUSEN WORKS).

they deserve from the circles that are interested. Ritter offers an answer to the question—how and in what way it may be possible to create soon in Hamburg an adequate rubber market that shall be in keeping with the importance of our rubber manufacturing industry.

He comes to the conclusion that the erection and maintenance of an independent plantation rubber market of the first rank in Hamburg, with all the great advantages it offers, can very well be carried out if a strict organization is established and the necessary measures are taken, that were essential in the creation of the foreign competitive markets (especially in London). Among the requisite measures and arrangements of which the aforesaid treats, the following may be mentioned briefly:

1. Equalization of freight charges for plantation rubber from the Eastern ports direct to Hamburg (a measure to be taken later).
2. Storage in the rubber associations' storage warehouses; uniform certificates of weight and storage receipts; uniform and regulated furnishing of samples, etc.
3. Requisition of uniform contract rules which shall at all times be fair to the interests of importers, brokers and dealers.
4. No private book sales, but public sales of definite, incoming, consigned lots, outside of free traffic.
5. Development of the rubber futures market.
6. Appointment of a committee of experts, which shall undertake the prompt and technical settlement of all differences of opinion.
7. Promotion of direct trade between the rubber plantation districts and Hamburg through the activity of German rubber traders and the financing of crude products exportation to Hamburg by German banking institutions, especially in Dutch India.

Ritter wishes through his appeal to call the attention of the persons concerned to this matter, of unusual importance for German economic life, by showing that it must be our endeavor to attain what the United States has already won during the war, namely, independence of middlemen and elimination of the circuitous way through London.

We can only wish that the sensible and certainly feasible ideas of Mr. Ritter may fall on fruitful soil and may also be sufficiently understood by the commercial class in Hamburg itself. It seems as though the pleas had really aroused interest here. The Hamburg crude rubber dealers are fighting energetically against the contemplated establishment by the Imperial Ministry of Commerce of a rubber and asbestos industry trust. They declare that the inclusion of the rubber trade in the rubber and asbestos trust and the establishment of a foreign trade office is wholly impractical for rubber importation and is uneconomical since the supply and the trading would be subject to the costs of this organization and consequently the price of raw materials would be needlessly increased for the German consumer. Importation into free ports, intermediate trading with foreign lands, and dealings in the goods lying in free ports must be kept free from any centralizing regulation; otherwise, the business of the Hamburg market, including the business in futures, would be driven to the competitive markets like Rotterdam, Antwerp, Liverpool, London, etc.

The old order is destroyed, the new must stand on firm foundations. When will all the clouds which surround the future of the German rubber industry be driven away?

#### GERMANY'S RUBBER REQUIREMENTS.

Among the raw materials which Germany desires the allied and associated governments to furnish, and regarding which inquiry as to quality, quantity and price has been made of the Committee on Minutes of Reparation Commission in Paris, is a monthly supply of 2,500 tons of raw rubber. This indicates a contemplated annual consumption of 30,000 tons, or nearly double what it was before the war.

#### SWEDEN CONTINUES RESTRICTION OF RUBBER EXPORTS.

Sweden still forbids the exportation, except when properly licensed, of: rubber, gutta percha, balata, reclaimed rubber, rubber thread; solid rubber tires, even if in lengths; inner tubes and outer covers and parts thereof, even when in combination with other materials for cycles and motor cars; rubber boots and shoes and rubber waste and scrap. Likewise: cycles and motorcycles with rubber tires fitted; carriages, vehicles and frames, without motors but with rubber tires; carriages, vehicles and frames, including airplanes and airships, with motors and the wheels with rubber tires for such carriages. Cycles, motorcycles, motor cars, airplanes and airships, however, may be exported if they had been imported into Sweden for the owner's own use, while travelers leaving the country may take such vehicles with them, provided they agree to reimport them into Sweden.

#### ENGINEERING CONGRESS AND INDUSTRIAL EXHIBITION IN JAVA.

A congress to which engineers from all countries touching the Pacific are invited, will be held at Weltevreden, near Batavia, Java, May 8 to 15, 1920, under the patronage of the Governor-General, at which over 170 papers on engineering problems in Asiatic countries will be presented. Among them will be several discussing the production of rubber.

Following the congress an industrial exhibition will be held at Bandoeng, which, while primarily intended to stimulate domestic industries, will give manufacturers of tools, machinery, bicycles and motorcycles, an opportunity to exploit their products. American houses must be represented by a Java firm in order to exhibit. A list of machinery houses in Java will be available for those who are interested.

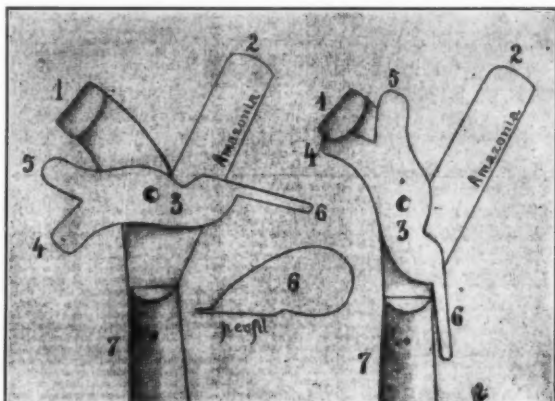
Further information can be obtained by addressing B. J. Krol, secretary of the Netherlands Indies Industries Fair, 39 Oosteinde, Bandoeng, Java.

Applications for participation in the congress should be sent to the Secretary, Molenvleit East 3, Weltevreden, Java, who will arrange for hotel accommodations and trips.

## Rubber Planting Notes.

### A NEW BRAZILIAN TAPPING KNIFE.

IN the face of the rivalry of the East Indian plantations the more intelligent Brazilian rubber men have not gone to sleep. The study of improvements in cultivation, in gathering the crop and in preparing the latex has been going on for some years at *Seringal Miry*, the experiment station at Manáos. One result of this activity is the invention of the Amazonia tapping knife, by José Claudio de Mesquita, president of the *Club da Serin-*



("A Seringueira.")

THE AMAZONIA TAPPING KNIFE.

*gueira*, to be used for the purpose of doing the least possible damage to the trees.

Referring to the figures in the illustration, blade 1 cuts a channel in the bark with an inclination of 45 degrees, the depth of which is barely sufficient to let the latex run without overflowing the incisions made by blade 2 in the interior wall of the channels. The movable key 3 is provided with guide 4 that regulates the direction and depth of the cut, while the part 5 removes the pieces of bark from the curved blade. The key 6 is held between the thumb and the forefinger, and is moved or held in place, according to the service required of parts 4 and 5.



("A Seringueira.")

METHOD OF TAPPING AT SERINGAL MIRY.

Preliminary to tapping at *Seringal Miry* it is customary to mark off the circumference of trees, which must be at least  $\frac{1}{2}$ -meter in girth three feet above the ground, into three longitudinal sections, each one of which in succession is to be tapped for two years, in order to return to the starting point in seven

years. When the tree is more than a meter in girth, as shown in the picture, each of the three sections is divided into two or more equal portions of twenty to thirty centimeters each for tapping purposes.

### POSITION OF PARA RUBBER.

Trade in Pará for the quarter ended with June was extremely depressed because the very low price of rubber was aggravated by a rise in exchange Pará, while the Amazon valley is passing through a crisis; it is impossible to produce rubber under the conditions prevailing in Brazil so as to compete with the best Eastern plantation rubber when it sells for 40 cents a pound. The fiscal year, July, 1918, to June, 1919, has been a poor one for rubber, the receipts being only 31,400 tons, as compared with 35,000 in 1917-1918 and 37,600 tons in 1916-1917; it is the smallest crop since 1903-1904 when the receipts were 30,390 tons. There has been a steady decrease in island rubber with an increase in the upriver production. The exports for the year were 13,265 tons to the United States, and 4,924 tons to Europe, while the exports for the first six months of 1919 were 19,492 tons to the United States and 7,532 tons to Europe. However, not all of this was sold.—"Board of Trade Journal."

### RUBBER SEED OIL WASTE AMOUNTS TO \$8,500,000.

It is estimated that on the rubber plantations of the East some 300 pounds of rubber seeds per acre fall to the ground and are allowed to rot, despite the \$8.50 worth of valuable oil extractable from them and the various uses to which the husks and meal might be put. A further computation of this waste is interesting.

Of the 2,000,000 acres now embraced by Eastern rubber estates some 1,000,000 acres are now in bearing. This means that 150,000 tons of dried rubber seed kernels, go to waste annually. From these kernels 42 per cent of oil is extractable. In other words, 15,750 tons of oil worth \$540 per ton and aggregating \$8,500,000 are being wasted annually. For most purposes rubber seed oil is a very good substitute for linseed oil now selling at some \$650 per ton, and has several times brought about five-sixths the price of the better oil. The cost of collecting and decorticating the seeds, packing and shipping the kernels to England is estimated at \$50 a ton.

### JAVA PLANTATIONS DAMAGED BY VOLCANO.

The plantations of the Rubber Trading Co., Limited, at Soerabaya, and the Djaboong Rubber Maatschappij at Serakcentjong, the Kroewoek of the Kroewoek Estates, Limited, and the Kali Koenig of the Landbouw Mij., Oost-Java, were severely damaged by volcanic ash during the eruption of the volcano Kloet, near Batavia, Java, last May. The rubber plantations of Soember Petoeng, and, in fact, all plantations, have been greatly damaged by falling ash. The eruption prevented tapping for a period of about five weeks.

J. W. WIJNAENDTS VAN RESANDT, WHO HAS BEEN FOR SEVEN years superintendent of the Anglo-Dutch Estates Agency, Limited, Batavia, Java, recently left that city for a permanent stay in The Netherlands. He is well known among planters of Middle and West Java and especially among those of East Java.

Mr. Wijnaendts van Resandt came to Java in 1902 where he acquired a practical knowledge of rubber culture, and later studied the cultivation of rubber trees in the Federated Malay States. For several years he served on the board of directors of the Nederlandsch-Indisch Landbouw Syndicaat (N. I. Agricultural Syndicate) and was also a member of the board of the Experiment Station at West Java.



#### HARBOR ON SUMATRA'S WEST COAST.

Pulau Bay, a few miles south of Benkulan, on the west coast of Sumatra, has been known for over 250 years as the safest harbor on that coast, and is famous as the "the bay of Selebar," the town from which the pepper came. A good many years ago a big Arab sailing junk sank at the entrance to the harbor and blocked it. Now efforts are to be made to remove the obstacle because the harbor is close to rubber and fiber plantations. There is, moreover, water-power near at hand.

#### BROWN BAST ON TAPPED HEVEA.

**B**ROWN BAST is the most wide-spread and injurious plague of plantation rubber in the Far East, and is therefore being investigated in the laboratories of Ceylon, Malaya, Southern India and the Dutch East Indies. The disease and its effects are described by Professor T. Petch in a leaflet issued by the Ceylon Department of Agriculture.

Brown bast attacks the cortex of *Hevea*, apparently only in trees that have been tapped. The tree runs dry, the tapping cut ceasing to yield latex, either wholly or partially, and in the latter case the latex coagulates on reaching the dry part and blocks the cut, so that later latex runs down the stem of the tree instead of along the cut to the vertical channel. This diseased cortex is a yellowish gray, dotted with brown spots and streaks; it may also be sodden and watery. In well defined cases a brown line runs along the cut very near the cambium.

If let alone, the tissue outside the brown line may dry up, forming a scale which, when it pulls off or is removed, leaves a thin layer of laticiferous cortex, one or two millimeters thick, that is speckled or thin and develops nodules. Or else no scale appears, yet the nodules develop under the surface just the same. Then the tree cannot be tapped.

The final effect of brown bast is to form nodules or burrs which interfere with or stop the flow of latex. These are a secondary feature of the disease; if they did not develop it would not be so serious. The disease may attack the whole tree or vital parts or may appear on a portion only of the cortex. Nodules also appear in the cortex that are not formed by brown bast.

Three methods are employed to get rid of brown bast by removing the diseased cortex to the depth that is necessary. These are: stripping; scraping; after which the spot is painted with Brunolinum plantarium, in which Professor Petch has great faith, and tarring. Trees that are badly affected had better be destroyed.

As to the nature of the brown bast, scientific men still differ. A few still believe that it is a fungus or other microorganism which carries infection. Rands, who was an advocate of this theory, seems to have changed his opinion materially. In April he held that "brown bast is an accentuated condition of gum secretion, probably resulting from response of the tree to the present methods of tapping." On the other hand, in January, 1919, the mycologists Belgrave, Perry and Richards reported that they had been unable to discover any microorganic cause for the disease.

W. Bobiloff in the "*Archiv voor de Rubber Cultuur*" for May sums up the case in reporting his experiments. The disease either is caused by infection or is a physiological phenomenon. Investigators have been unable to discover the microorganism that could carry it or to produce the infection by putting sound bark in contact with the diseased. Bobiloff experimented with trees on which he tried excessive tapping, and brought on the disease at once. His explanation is that brown bast is formed by drawing the latex from the bark and the cause therefore is purely physiological. The brown degenerate substance gave the principal reactions for lignine; so he holds that it is not yet proved that it is a gum, as Rand asserts. Harrison connects it

with wood pulp. The slightest trace of brown bark could be detected by a phloroglucin reaction, which colored the spot red. The severity of the disease depends on the general physiological condition of the trees.

Agriculturists, as contrasted with laboratory men, advise giving the trees a rest, in the first place, then, that the soil be manured and drained, etc. They suggest that trees be raised from seedlings instead of cuttings, as those are believed to be less subject to disease, and tapping be improved so as not to wound the trees so severely. All seem to agree that tapping and the condition of the tree have more to do with the disease than possible infection.

#### PLANTING RUBBER IN WEST DUTCH BORNEO.

By J. W. Evans.

**S**AY "Dutch East Indies" to an American rubber man and he thinks of Java, Sumatra and a few islands of comparatively slight importance. But only an exceptionally well-informed man would think of West Dutch Borneo. Concerning that region as a field for the rubber man, next to nothing is known. It is generally understood that there is considerable coconut growing along the coast from Paloh to Pontianak, but that's about all.

Rubber cultivation has grown enormously in West Borneo during the last ten years, and the only reason why the fact is not known and the opportunity not recognized is that almost none of the rubber estates are owned by Europeans or Americans. Almost 90 per cent of the rubber plantations are in the hands of Chinese, Malays, and Japanese.

The reason why so little European or American capital has found its way to the rubber cultivation of West Borneo is that the region has been a field for irresponsible speculation. Sound investors have been afraid to go in there because various estates were opened up either by people who knew nothing about rubber and the conditions in Borneo, or by people who formed syndicates purely for speculation, and got from under as soon as their object was accomplished.

In consequence of such fast and loose methods the country got a bad name which it was far from deserving, for the condition of soil, climate, labor, and transportation are such that extensive and profitable rubber cultivation is perfectly practicable there, and the field is new.

Borneo, as a field of rubber, compares favorably with the East coast of Sumatra, the Straits Settlements, the Federated Malay States, and even Java. As to climate, indeed, it is especially suitable. Rain falls there in right proportion all the year, and there is no dry season such as Java has to contend with. That the soil is excellent is shown by the rapid growth of trees and the large yield of latex.

Here are some production figures from one estate in West Dutch Borneo which was badly run, and so neglected, and which suffered so much from the wild boar that it might have been expected to produce poorly. Seven-year-old trees which were planted too close and had never been thinned, produced as a yearly average 3.65 pounds per tree. Compare that with the results from 7 to 9-year-old trees elsewhere. In Malacca the average annual yield per tree is 2.42 to 3.41 pounds; in Ceylon, .77 to 1.65 pounds; in West Java, 2.42 pounds; on Sumatra's East Coast, 3.98 pounds on choice estates, and 2.97 pounds on average estates.

By contrast, there is an exceptionally well-kept Chinese-owned estate in Sambas, a locality in West Dutch Borneo where the trees were well spaced, and the yield for 6 to 7-year-old trees amounted to 5.28 pounds per tree a year.

Contrary to the general impression, labor conditions in West Borneo compare favorably with those in the Federated Malay

States, the Straits Settlements and Sumatra East Coast; for these places depend for labor on emigration from Java, China and British Indies, while Borneo has an abundance of local laborers. The Dyaks are adapted for heavy work, such as felling jungle; and the Malays for light work, such as weeding, tapping and preparing the product; however, it is not to be understood from this that labor conditions in Borneo are ideal. A big increase in rubber cultivation there might make immigration necessary. But at present the estates owned by Europeans are worked with help locally obtained. Japanese contract labor, however, is sometimes cheaper.

Transport facilities are not what they should be, but that is met by locating estates near rivers by which very cheap transportation to harbors becomes possible. In the developed rubber regions such as Sumatra East Coast, thousands are spent yearly for the building and upkeep of roads, and for bullock carts and motor trucks to carry the rubber from the estates to the nearest railroads or port. This is costly. In Borneo a lighter costing 100 guilders, about \$40, does the work; there is communication with Singapore three times a month.

Here are some figures that seem to demonstrate that West Borneo deserves investigation by men who desire to invest in rubber plantations and prefer to do it in a new country:

	Average of Sambas Estates.	26 Java Estates.
Average number of trees per bouw (1.75+ acres).....	203	300
Age of trees .....	8	7
Average in bearing .....	497	170
Total output per year in pounds.....	328,730	101,884
Number of trees in bearing.....	93,666	27,955
Average yield per tree in pounds.....	3.45	3.65
Average number of trees per tapper.....	304	300
Average yield per day per tapper in pounds.....	2.95	1.41
Percentage of first-grade rubber.....	79.9	80
All-in-cost per pound, dry, in United States currency.	0.18	0.17

It must be borne in mind that most of the estates are in the hands of Malays and Chinese, who do not get anything like the yield of rubber that they might if they knew scientific rubber culture. What Borneo is capable of with the right kind of rubber culture is certainly worth attention and investigation.

#### RUBBER IN THE STATE OF VERA CRUZ, MEXICO.

(Special Correspondence.)

MANY RUBBER PLANTATIONS were located in Vera Cruz. The state has suffered much during the last two years. It is overridden with all kinds of bandits. Some claim to be political chieftains, like Felix Diaz and Pelaez, but the rest are plain bandits. Pelaez is controlling the oil zone below Tampico. Rubber grows in that neighborhood, but no big plantations are known to exist in the territory under Pelaez's control.

Indians are tapping wild trees to a certain extent and they are making nice "ponchos" or rubber coats. They buy from merchants in the Huasteca Hidalguense ready-made garments or "ponchos" made of plain cotton duck, and bring them to their native villages. Then they tap the *Castilloa* and brush the latex on the cotton garments. The latex is spread with an ordinary paint-brush, and between each coating the garments are exposed to the sun for drying. When finished, they have an amber color. The coating is generally made on both sides of the cotton duck. After the goods have been coated several times and are considered ready, they are returned to the merchants in Tulancingo, and other towns of some importance. Very often these Indians have a credit in those country stores, or they are forced to trade there for other reasons. The ponchos made by these Indians are very good sellers, although they do not look as well as imported waterproofs. Their main advantage consists in the fact that they do not stick. Merchants are getting very good prices for these garments as they last very long, and, considering the service they give, are not expensive. If necessary they can be repaired by coating with fresh latex and curing in the sun.

Felix Diaz has control over the southern part of the State of Vera Cruz, and where he is shifting from place to place there are several rubber estates, most of which have been abandoned. However, near San Andres Tuxtla, the large Hacienda de Montepio, owned by Senator Clark, did not suffer very much. The manager had to run, but the estate was left under the care of a Cuban foreman, and was not damaged badly; of course, implements, horses and mules were taken, but that is now considered a trifle in these days of wholesale looting.

Some plantations along the Isthmus line, running from Cordoba to Santa Lucrecia, have suffered so much that nearly all of them have been abandoned by their legitimate owners. The country there is overridden with bandits, and one of them, called Panuncio Martinez, is the most dangerous and cruel of all of them. The Carranzistas have not been able to catch him. For a long time his headquarters were at Hacienda del Palmar Grande, near Tezonapa, Vera Cruz, a very beautiful estate which had once been the property of the French firm of Lions Hermanos y Cia. of Puebla, and which became afterwards the property of a Scotch company. One of the brothers, Olsson-Seffer, was the manager for some time. The place has been ruined by the revolutionists, the same as the other neighboring plantations. A big banana plantation on the Rio Tonto has been abandoned, and the same can be said of the big sugar estate called La Oaxaqueña, near Santa Lucrecia.

Panuncio Martinez has been terrifying the whole district and from time to time, the Carranzistas attempt to chase him, making things worse for all the unlucky neighbors, because all the places near the headquarters of Panuncio Martinez are sacked and burned in order that he may not use them as a base or a shelter. This was the fate, about a year ago, of the plantation called La Union, of Isidro Barrios y Cia. The place chances to be on the road to El Palmar, yet the owners had no connection whatever with Panuncio Martinez and were begging for protection. The "expedition was a success," as the Carranzista ditty always states and "Panuncio was done." When retiring to Cordoba the Carranzistas burned La Union, that Martinez might not use it as a base or shelter. That is the method of pacifying the country used by the Carranzistas. Plantation owners are thrown from the frying-pan into the fire when they apply for protection. After such a raid of the Carranzistas, all the fowls, pigs, etc., of the poorer people and the farm-hands, or *peones*, have been taken along with every bit of foodstuff which had escaped from the greedy hands of Panuncio Martinez and other patriots of his class.

#### THE COST OF BUSINESS IN MEXICO.

One of the principal reasons why so few Americans have attempted to conduct mercantile business in Mexico is shown by the accompanying estimate of the annual expenses of such an enterprise furnished by a business man of Guaymas, Sonora.

State taxes on the business at 8 per cent annually.....	\$200.00
60 per cent Federal tax on State tax.....	120.00
State taxes of 2 per cent on retail sales, estimating that sales amount to \$15,000 per year.....	300.00
60 per cent Federal taxes on \$300.....	180.00
Stamp taxes on retail sales of \$15,000 at 5 mills annually.....	75.00
Municipal taxes, considering the business as fifth class.....	50.00
60 per cent Federal tax on \$50.....	30.00
Water at \$2.50 monthly, one year.....	30.00
Electric lights .....	120.00
One telephone .....	53.80
Rent of building .....	900.00
Interest on a capital of \$25,000 at 12 per cent annually.....	3,000.00
Salaries of office and store employees, including salary of manager .....	7,800.00
Minor expenses, such as paper, stationery, office fixtures.....	142.20
Total .....	\$13,000.90

Taking 25 per cent as a basis of profit on the cost price of the merchandise, it would require annual sales amounting to \$75,000 to obtain a net income of \$5,750, not counting the \$3,000 which the capital would earn at 12 per cent.

In the estimate, taxes on wholesale transactions are not included, it being presumed that they are paid by the purchaser.

## Recent Patents Relating to Rubber.

## THE UNITED STATES.

ISSUED AUGUST 5, 1919.

- N**O. 1,311,883. Pneumatic tire. J. C. Eubank, Chicago, Ill.  
 1,311,999. Resilient wheel. W. Rokosz, Calumet, Mich.  
 1,312,022. Inner tube with transverse resilient springs. J. W. Bassham, Columbia, Tenn.  
 1,312,124. Rubber tire with internal air chamber. E. B. Killen, London, Eng.  
 1,312,200. Respirator. A. Patus, assignor of  $\frac{1}{2}$  to H. H. Mandel—both of South Bend, Ind.  
 1,312,415. Wheel with rubber tire. D. Moriarty, Oakland, Calif.  
 1,312,457. Pressure rage for tires. M. C. Schweinert, West Hoboken, and H. P. Kraft, Ridgewood—both in New Jersey. (Original application divided.)  
 1,312,482. Pneumatic tire. H. G. Imhoff, Waterloo, Ia.  
 1,312,506. Vehicle rim and tire. H. M. Fisk, Chicago, Ill.; N. A. Fisk, administratrix.

ISSUED AUGUST 12, 1919.

- 1,312,528. Rubber sole for turn shoes. G. Ferguson, Wollaston, Mass., assignor by mesne assignments to United Shoe Machinery Corp., Paterson, N. J.  
 1,312,535. Transversely split demountable rim for tires. C. W. Gressale, assignor by mesne assignments to The Standard Parts Co.—both of Cleveland, O.  
 1,312,681. Fountain pen. W. L. Chapman, Brooklyn, N. Y.  
 1,312,781. Waterproof boot with thin upper portion adapted to be folded over upon the ankle portion, etc. H. J. Flannery, Pittsburgh, Pa.  
 1,312,830. Electrically heated garment. C. E. Camm, Salt Lake City, Utah, assignor of  $\frac{1}{2}$  to W. H. Turver, Los Angeles, Calif.  
 1,312,923. Legging with encased resilient means for limiting movement. M. Rosenwasser, Astoria, N. Y.  
 1,312,941. Teat-cup for milking machines. C. M. Anderson, Waterloo, Ia.  
 1,313,007. Elastic non-inflatable tire. C. A. Morrison, Delaware, O.  
 1,313,021. Hot-water bottle. G. M. Scott, Scotts Mills, Ore.  
 1,313,037. Elastic fabric. C. Adams, East Rutherford, N. J.  
 1,313,118. Rubber heel. A. Santacroce, assignor of 3/10 to J. Grumbos and 3/10 to S. Sadaris—all of Elyria, O.  
 1,313,215. Garment supporter. T. L. Caudle, Wadesboro, N. C.

ISSUED AUGUST 19, 1919.

- 1,313,254. Resilient tire. J. W. and G. F. Burgess, Kansas City, Mo.  
 1,313,307. Suction-cup holding device for portable apparatus. J. B. Lofcraft, Washington, D. C.  
 1,313,400. Detachable heel. C. P. Maher and E. J. Fetherstonhaugh, Montreal, Que., Canada.  
 1,313,424. Cushion tire. H. H. Stern, Moscow, Ida.  
 1,313,442. Arch support. L. W. V. Wilms, Chicago, Ill.  
 1,313,506. Pneumatic tire. M. A. K. Shotwell, Miami, Fla.  
 1,313,553. Inflating valve for tires, etc. F. Nielsen, Boston, Mass., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.  
 1,313,566. Medicine dispenser. E. C. Trowbridge, Gloucester, Mass.  
 1,313,745. Gas mask and respirator. N. Schwartz, New York City.  
 1,313,749. Pneumatic tire. F. K. Small, Lisbon Falls, Me.  
 1,313,752. Jar-lifting tongs with rubber pads. H. C. Smith, Waterloo, Ia.  
 1,313,824. Demountable rim for tires. G. Knowling, Jr., St. John, Newfoundland.  
 1,313,868. Puncture-closing device for tires. B. Urich, Milwaukee, Wis.

## REINFORCE.

- 14,710. Rubber sponge over frame converting it into receptacle for soap, etc. R. F. Hobbs, Great Neck, N. Y. (Original No. 1,173,802, dated February 29, 1916.)

ISSUED AUGUST 26, 1919.

- 1,313,913. Automobile wheel. H. D. Rey, Avarua, Rarotonga Island, Cook Islands.  
 1,313,914. Flush-tank bulb. F. T. Roberts, Cleveland, O.  
 1,313,923. Garter. W. H. Stevens, New York City. (Original application divided.)  
 1,313,924. Pneumatic arch and heel support. B. Stewart, Erie, Pa.  
 1,313,979. Air-valve attachment for tires on disk wheels. F. Bernardi, Stockton, Calif.  
 1,314,104. Fountain pen and clip. J. C. Wahl, Chicago, Ill., assignor to The Wahl Co., Wilmington, Del.  
 1,314,110. Sectional demountable rim for tires. J. C. Youngblood, Atwood, Kans.  
 1,314,158. Fountain comb. A. R. Spielberger, Atlanta, Ga.  
 1,314,185. Bathing-suit or life-preserver. J. M. Combs, Akron, O.  
 1,314,299. Life-saving union suit. F. Zaccard and T. P. McDonough, Chicago, Ill.  
 1,314,342. Pneumatic roll, with inflatable inner cushion. G. A. Lawrence, Woburn, assignor to The Turner Tanning Machinery Co., Peabody—both in Mass.  
 1,314,343. Jointure for vulcanized rubber parts, as in hot-water bottles. J. L. Mahoney, New Haven, assignor to The Goodyear India Rubber Glove Manufacturing Co., Naugatuck—both in Conn.  
 1,314,374. Tube with filter, for drinking from springs, etc. B. A. Stair, Los Angeles, Calif.  
 1,314,393. Rubber heel. D. D. Granger, New London, O.  
 1,314,414. Expandible wheel rim. J. H. M. Michon, Washington, D. C.  
 1,314,415. Collapsible wheel rim. J. H. M. Michon, Washington, D. C.  
 1,314,416. Collapsible wheel rim. J. H. M. Michon, Washington, D. C.

## THE UNITED KINGDOM.

ISSUED AUGUST 7, 1919.

- 127,727. Metallic diving-suit with rubber-covered finger joints. R. de Graff, 571 West 139th street, New York City, U. S. A.  
 127,776. Shaped toe and heel portions connected by elastic straps, for repairing galosh portion of shoes of satin, velvet, etc. F. G. Knowles-Foster, 72 Oakwood Court, Kensington, London.  
 127,791. Fountain pen. C. R. Keeran, 360 East Grand avenue, Chicago, Ill., U. S. A.  
 127,792. Surgical sand-bag covered with loose or adherent envelope of seamless rubber. K. R. Banks, 11A Earl's Court Square, London.  
 127,795. Pneumatic sucker fasteners with auxiliary suction cup inside and formed integrally with main cup. C. M. Wolcott, 321 West 118th street, New York City, U. S. A.  
 127,818. Tire valve. Michelin & Cie., Clermont-Ferrand, France. (Not yet accepted.)  
 127,884. Telephones for aviators, with elastic bands, rubber gaskets, etc. Western Electric Co., Norfolk House, Victoria Embankment, Westminster. (Le Matériel Téléphonique Société Anonyme, 46 avenue Breuteuil, Paris.)  
 128,009. Fountain pen and clip. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Conklin Pen Manufacturing Co., Toledo, O., U. S. A.)  
 128,024. Cushion tire with soft rubber tread and hard rubber base. F. W. Howorth, 10 New Court, Lincoln's Inn Fields, London. (K. F. & C. Tire & Rubber Corp., 610 MacBain Building, Roanoke, Va., U. S. A.)  
 128,063. Rubber tire. F. W. Howorth, 10 New Court, Lincoln's Inn Fields, London. (K. F. & C. Tire & Rubber Corp., 610 MacBain Building, Roanoke, Va., U. S. A.)  
 128,113. Chewing gum containing caffeine or a derivative. S. W. Cramer, 401 East Morehead street, Charlotte, N. C., U. S. A.

ISSUED AUGUST 13, 1919.

- 128,309. Breathing apparatus. R. H. Davis, 187 Westminster Bridge Road, London.  
 128,340. Hair-curling appliance. C. Nessler, 657 Fifth avenue, New York City, U. S. A.  
 128,384. Saddle-tops for cycles, etc., made of vulcanizable, fiberized rubber and comminuted cotton, reinforced by wire or cords. J. Kelley, 41 Spon street, Coventry, and H. Jelley, Westover, Selly Park, Birmingham.

ISSUED AUGUST 20, 1919.

- 128,426. Rubber pencil shield. G. J. Page, 60 Myddleton Road, Bowes Park, London.  
 128,505. Pneumatic-tire rim. A. Wroe, Sydney Grove, Lamcote, Radcliffe-on-Trent, Nottinghamshire, and E. Jennings, 7 St. Peter's Place, Broad street, Birmingham.  
 128,529. Latex-collecting apout. W. J. Thornmill, 4 Millbank street, Westminster.

ISSUED AUGUST 27, 1919.

- 128,844. Flush-tank bulb-valve of rubber, etc. F. T. Roberts, 1105 Lakeview Road, and R. H. Rosenfield, 1895 East 71st street—both of Cleveland, O., U. S. A.

## THE DOMINION OF CANADA.

ISSUED AUGUST 19, 1919.

- 192,194. Respirator. E. D. Rogers, Oakdale, La., U. S. A.  
 192,215. Breast pump. Becton Dickinson & Co., Rutherford, assignee of G. O. R. Schwidetzky, Hasbrouck Heights—both in New Jersey, U. S. A.

ISSUED AUGUST 26, 1919.

- 192,252. Truck tire. H. B. Foley, Minneapolis, Minn., U. S. A., and M. L. Foley, Toronto, Ont.  
 192,279. Resilient wheel. S. Grossman, New York City, U. S. A.  
 192,280. Inner tube. J. H. Hamlin, Winston-Salem, N. C., U. S. A.  
 192,281. Wheel with solid core, for carrying pneumatic tire. W. H. Hayter, South Norwood, London, S. E. 25, Eng.  
 192,295. Hot-water bottle. A. H. Leighton, McMinnville, Ore., U. S. A.  
 192,301. Captive balloon. J. N. Lewis, Detroit, Mich., U. S. A.  
 192,333. Diving dress. F. W. Walters, Auckland, N. Z.  
 192,335. Resilient wheel. S. A. Wheatley, La Grande, Ore., U. S. A.  
 192,350. Safety spring slings for parachutes. The E. R. Calthrop's Aerial Patents, Limited, assignee of E. R. Calthrop—both of London, Middlesex, Eng.

ISSUED SEPTEMBER 2, 1919.

- 192,471. Parachute. The Goodyear Tire & Rubber Co., assignee of R. H. Upson, both of Akron, O., U. S. A.

## THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

- 490,301. (May 29, 1918.) Improvements in the manufacture of gloves, P. C. Ayers.  
 490,333. (May 31, 1918.) Pneumatic decoy for blackbirds. M. Verando.  
 490,630. (September 4, 1916.) Hermetic seal for all kinds of tuns, casks, etc. B. Epinat.  
 490,688. (June 29, 1918.) Rim for pneumatic tire. Stinements Rim Co.  
 490,719. (July 2, 1918.) Lift for shoe heels. T. Henne.  
 491,679. (May 13, 1918.) Resilient wheel. H. W. Blacklock and M. W. Brill.  
 491,757. (September 14, 1918.) Tire valve. A. Schrader's Son, Inc., Brooklyn, N. Y., U. S. A.



- 491,758. (September 14, 1918.) Suction pump coupling, etc. A. Schrader's Son, Inc., Brooklyn, N. Y., U. S. A.  
 491,777. (September 14, 1918.) Improvements in wheel tires. E. W. Edwards.  
 491,785. (September 10, 1918.) Shoe with pneumatic sole. G. E. C. Gerber.  
 491,717. (September 12, 1918.) Improvements in a rectal douche. T. H. McNamara.  
 491,854. (September 9, 1918.) Wheel tire and its method of manufacture. K. F. & C. Tire & Rubber Corp.  
 491,862. (September 20, 1918.) Improvements in applying flexible rubbers to replace spring-plates of vehicles. W. F. Cottrell.  
 462,063. (October 3, 1918.) Improvements in rubber tires, particularly solid tires. Société Française B. F. Goodrich.  
 492,095. (December 22, 1917.) Pneumatic wheel with internal pressure, applicable to all vehicles and particularly to automobiles, motorcycles, airplanes, etc. J. M. C. Semery.  
 492,022. (September 30, 1918.) Improvements in artificial limbs. C. A. Adams.  
 492,121. (August 3, 1916.) Life-saving apparatus. R. Kubja.  
 492,232. (October 10, 1918.) Improvements in automobile wheels, etc. E. A. Vivinkson and J. G. Raphael.  
 492,172. (October 5, 1918.) Improvements in leggings. Mme. E. Charlet, née B. F. Bergougnan.  
 492,172. (October 5, 1918.) Improvements in removable nails for heels. G. W. Berry.

## NEW ZEALAND.

ISSUED JULY 10, 1919.

- 41,351. Reinforced cover for pneumatic tires. W. J. Dalby, Orient Road, Magill, South Australia.

ISSUED JULY 24, 1919.

- 40,490. Resilient wheel. C. C. Crump, McKenzie Road, Khandallah, Wellington, N. Z.  
 40,775. Inner tube of shingle construction. I. B. Jeffries (trading as Isaac Benjamin), 3 John street, Llanelly, Carmarthen, Wales.  
 41,552. Safety foot for ladder, crutch, etc. H. H. Amadio, 150 Regent street, Redfern, near Sydney, N. S. W.  
 41,665. Corset with elastic vest section. A. C. Hopwood, 408 Commerce House, Flinders street, Melbourne, Victoria. (Nomininee of the Dominion Corset Co., 29-45 Dorchester street, Quebec, Canada, assignee of S. J. Newman, New Haven, Conn., U. S. A.)

## TRADE-MARKS.

THE UNITED STATES.

- N O. 99,332. The words ARCH BUILDER—arch supports. Alexander E. Block, St. Louis, Mo.  
 100,808. The word Loxot—soles of artificial leather. Madelether Co., Saugus, Mass.  
 105,530. The words GOLDEN RULE—rubber boots and shoes. United States Rubber Co., New York City.  
 109,279. The words LIFE SAVERS—chewing gum, etc. Mint Products Co., New York City.  
 111,216. The word KEMPEO—artificial leather. Charles H. Kemper, Westport, Conn.  
 115,952. The word REPAIR in white letters against a black rectangle—rubber patches for repairing rubber or fabric articles. Helmer E. Erickson, Chicago, Ill.  
 116,662. Representation of a rubber-heel lift bearing the words "DIAMOND GRIP" and a knurled diamond—rubber heels. Robert E. Miller, Inc., New York City.  
 116,683. The word FISK—rubber tires. The Fisk Rubber Co., Chicopee Falls, Mass.  
 117,226. Representation of a shield, quartered, bearing a conventional design—rubber-tire casings. The General Tire & Rubber Co., Akron, O.  
 117,698. The words REPCO, SERVICE, QUALITY, RELIABILITY, VALUE within the center and border of a white-bordered black diamond—rubber tires. Republic Rubber Tire & Shoe Co., New York City.  
 117,911. The word WINNER—rubber and canvas bicycle tires and tubes. Simmons Hardware Co., St. Louis, Mo.  
 118,929. The word JITS within a circle—rubber heels and soles. Charles M. Wolcott, Baltimore, Md.  
 118,185. The words HORSE-SHOE TIRES superimposed above the representation of a horse-shoe. Racine Auto Tire Co., Racine, Wis.  
 118,363. The word CACTUS—cement for use in patching rubber and fabric goods. Automotive Supply Co., Dallas, Tex.  
 118,381. The word DUOFLEX within a double-outlined oval—rubber tires. Austin Holcomb, Los Angeles, Calif.  
 119,242. The outline of a mitten—pneumatic tires. Worth L. Mitten, Davenport, Ia.

## THE DOMINION OF CANADA.

- 24,809. The words JOY RIDERS—chewing gum, etc. Frederick Weeb Brooke, Toronto, Ont.  
 24,816. Representation of a piece of rope in the form of a circle enclosing the words MINER'S and TRIUMPH and a device resembling the letter M—rubber footwear, heels and soles, clothing, coverings, cloth, belting, hose, tires, insulating material, and rubber cement. The Miner Rubber Co., Limited, Montreal, Que.  
 24,817. Representation of a piece of rope in the form of a circle enclosing the words MINER'S and ACE and a device resembling the letter M—rubber footwear, heels and soles, clothing, coverings, cloth, belting, hose, tires, insulating material, and rubber cement. The Miner Rubber Co., Limited, Montreal, Que.  
 24,865. The word GUARD—pneumatic tires, etc. Van der Linde Rubber Co., Limited, Toronto, Ont.

THE FRENCH REPUBLIC.  
TO AMERICANS.

- 26,480. The words WARNER SHAVING BRUSH—"EVERYTHING BUT THE RAZOR"—shaving brushes with bristles set in rubber. Warner-Patterson Co., 914 South Michigan avenue, Chicago, Ill., U. S. A.  
 26,463. The word FABRIKOID—imitation leather. Du Pont Fabrikoid Co., Wilmington, Del., U. S. A.

NEW ZEALAND.  
TO AMERICANS.

- 15,154. The words VULCO-CORD—machine belts, particularly automobile-fan belts. The Gates Rubber Co., Denver, Colo., U. S. A.

## DESIGNS.

THE UNITED STATES.

- N O. 53,672. Tire. Patented August 5, 1919. Term 3½ years. Arthur Breitenstein, Akron, assignor to Richard J. Birch, Cleveland—both in Ohio.  
 53,675. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.  
 53,676. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.  
 53,677. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.  
 53,692. Tire. Patented August 5, 1919. Term 14 years. Robert J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.  
 53,693. Tire. Patented August 5, 1919. Term 14 years. Robert J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.



- 53,709. Tire. Patented August 19, 1919. Term 14 years. C. W. Greene, assignor to The Bowling Green Rubber Co.—both of Toledo, O.  
 53,727. Tire. Patented August 26, 1919. Term 14 years. Arthur Breitenstein, Akron, assignor to Richard J. Birch, Cleveland—both in Ohio.  
 53,736. Automobile running board. Patented August 26, 1919. Term 14 years. John T. Hayne, Detroit, Mich.  
 53,737. Automobile running-board mat. Patented August 26, 1919. Term 14 years. John T. Hayne, Detroit, Mich.  
 53,749. Tire. Patented August 26, 1919. E. A. Reid, Trenton, N. J., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.  
 53,750. Tire. Patented August 26, 1919. E. A. Reid, Trenton, N. J., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.

## EDUCATIONAL MOTION PICTURES FOR FACTORY ENTERTAINMENTS.

The Bureau of Commercial Economics, Washington, D. C., circulates free educational motion picture films just as a Carnegie library circulates books without charge. It is an altruistic association which makes no profit on its films, being supported by endowment, annuity and voluntary subscription. With 21,000,000 feet of film on almost every conceivable subject, it has the largest educational film library in the world. Three subjects taken at random from the Bureau's catalog are "The Milk of the Tree" (Rubber), "Making Raincoats," "For the Common Good" (Welfare), Firestone Plant.

The Bureau provides the best source of films suitable for exhibition to rubber and allied trade employees in factories and club houses. Francis Holley, the director, urges employers of labor to let their work people feel that such picture shows belong to them. The employer could offer to provide space and equipment if the employees will run the show—select programs, order the films, etc. Thus a point of cooperation would be established between employer and employees that would be worth many times the cost of providing the "theatre." When necessary the Bureau will send a truck fully equipped to show the pictures outdoors at night.

## Review of the Crude Rubber Market.

### NEW YORK.

SEPTEMBER has been marked by a rather remarkable advance in the price of rubber of all grades that has lasted throughout the month. Ribbed smoked sheet, which sold for 44½ cents spot at the close of August, rose as high as 55 cents, at which price sales were made. There was a slight decline in prices towards the close of the month, due to speculative dealers going a little ahead of the actual demand, but the market is very firm and the demand for rubber strong. Manufacturers, not only of tires but of all kinds of goods, have been buying largely and have seemed ready to pay higher prices, but only for the amount of rubber they actually need. There has been a good deal of trading among dealers, which has caused some slight fluctuations in prices, but the demand is from consumers, so that prices are likely to stay up till they are supplied. The prices in the London market are higher than in New York.

The assertions that many Far Eastern planters have held back part of the product of their plantations out of patriotic regard for the requests of the British Government are not wholly credited by American importers, who do not believe that Singapore commands any very large reserve stock of rubber.

The Brazil market was quiet and inactive; the quantity yielded now is inconsiderable in comparison with the world's product and consumers are willing to pay the higher price only for the quantity they need, which is limited.

For guayule and balata the market has been very quiet.

Prices for plantation and for South American rubber at the beginning and toward the close of the month are shown in the following quotations:

**PLANTATION HEVEA.** August 30, first latex crêpe, spot 45½ cents, October-December 46½ cents, January-June 47 cents, January-December 1920, 48½ cents. September 22, first latex crêpe, spot 50 cents, October-December 50 cents, January-March 51 cents, January-June 51 cents, January-December 1920 52 cents.

August 30, ribbed smoked sheets, spot 44½ cents, October-December 45½ cents, January-March 45½ cents, January-June 46 cents, January-December 1920, 47½ cents. September 22, ribbed smoked sheets, spot 49 cents, October-December 49 cents, January-March 50 cents, January-June 50 cents, January-December 1920, 51 cents.

August 30, No. 1, amber crêpe, spot 42 cents, October-December 4½ cents. September 22, No. 1 amber crêpe, spot 47 cents.

August 30, clean thin brown crêpe, spot, 40 cents, October-December, 42½ cents, September 22, clear brown crêpe, spot 48 cents.

August 30, No. 1, roll brown crêpe, spot 32. September 22, No. 1 roll brown crêpe, spot 36 cents, October-December, 36 cents, January-March 38 cents.

**SOUTH AMERICAN PARÁ AND CAUCHOS.** Spot Prices: August 30, upriver fine 54½ cents, islands fine 47½ cents, upriver coarse 32 cents, islands coarse 22 cents, Cametá coarse 22 cents, caucho ball upper 32 cents. September 22, upriver fine, 55 cents, islands fine 49 cents, upriver coarse 34 cents, islands coarse 22½ cents, Cametá coarse 22 cents, caucho ball 33½ cents.

### NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on September 23, the current date:

	October 1, 1918. Free Rubber.	September 1, 1919.	September 23, 1919.
<b>PLANTATION HEVEA—</b>			
First latex crêpe.....	63 @	45½ @	49½ @
Amber crêpe No. 1.....	60 @	41½ @	46½ @
Amber crêpe No. 2.....	60 @	40½ @	45½ @
Amber crêpe No. 3.....	58 @	39½ @	44½ @
Amber crêpe No. 4.....	57 @	38½ @	43½ @
Brown crêpe, thick and thin clean .....	60 @	38½ @	44½ @

	October 1, 1918. Free Rubber.	September 1, 1919.	September 23, 1919.
Brown crêpe, thin specky...	50 @	36½ @	42½ @
Brown crêpe, rolled.....	44 @	32 @	37 @
Smoked sheet, ribbed, stand- ard quality .....	62 @	44 @	48½ @
Smoked sheets, plain, stand- ard quality .....	61 @	41 @	45 @
Unsmoked sheet, standard quality .....	60 @	39 @	42 @
Colombo scrap No. 1.....	46 @	33 @	38 @
Colombo scrap No. 2.....	44 @	31 @	36 @

### EAST INDIAN—

Assam crêpe .....	58 @	@	None
Assam onions .....	54 @	@	None
Penang block scrap.....	37 @	@	None

### PONTIANAK—

Banjermassin .....	15 @	10¼ @	12 @
Palembang .....	16 @	11¼ @	None
Pressed block .....	25 @	21 @	24 @
Sarawak .....	14 @	9¼ @	None

### SOUTH AMERICAN—

#### PARAS—

Upriver fine .....	68 @	54½ @	54½ @
Upriver medium .....	63 @	51½ @	52 @
Upriver coarse .....	40 @	31½ @	33 @
Upriver weak, fine.....	50 @	40 @	41 @
Islands, fine .....	59 @	48 @	47½ @
Islands, medium .....	52 @	44 @	45 @
Islands, coarse .....	27 @	21 @	22 @
Cametá, coarse .....	28 @	21½ @	22½ @
Madeira, fine .....	@	55 @	56 @
Acre Bolivian, fine.....	@	54½ @	55 @
Peruvian fine .....	67 @	53 @	52 @
Tapajos fine .....	60 @	53 @	53 @

#### CAUCHO—

Lower caucho ball.....	36 @	29 @	31½ @
Upper caucho ball.....	40 @	31 @	33 @

#### MANICOBAS—

Ceara negro heads.....	37 @	*34 @	38 @
Ceara scrap .....	37 @	*29 @	28 @
Manicoba (30% guarantee)	35 @	*32 @	35 @
Mangabeira thin sheet....	39 @	*38 @	38 @

### CENTRAIS—

Corinto scrap .....	39 @	31 @	33 @
Esmeralda sausage .....	39 @	31 @	32 @
Central scrap .....	31 @	31 @	32 @
Central scrap and strip....	@	29 @	29 @
Central wet sheet.....	35 @	23 @	23 @
Guayule (20% guarantee)...	48 @	25 @	24 @
Guayule, dry .....	28 @	35 @	35 @

### AFRICANS—

Niger flake, prime .....	33 @	@	@
Benguela, extra No. 1, 28%.	29 @	*24 @	@
Benguela No. 2, 32½%....	48 @	*25 @	25½ @
Congo prime, black upper...	48 @	34½ @	39 @
Congo prime, red upper....	@	34 @	35 @
Rio Nunez ball.....	55 @	@	@
Rio Nunez sheets and strings	@	@	@
Conakry niggers .....	55 @	@	@
Massai sheets and strings...	55 @	@	@

### GUTTA PERCHA—

Gutta Siak .....	28 @	20 @	23 @
Red Macassar .....	3.00 @	2.50 @	2.60 @
			25 @
			None

### BALATA—

Block, Ciudad Bolivar .....	71 @	70 @	74 @
Colombia .....	61 @	56 @	58 @
Panama .....	59 @	45 @	48 @
Surinam sheet .....	95 @	90 @	92 @
amber .....	97 @	92 @	94 @

\* Nominal.

### COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

	September.		
	1919. <sup>1</sup>	1918.	1917.
<b>PLANTATIONS:</b>			
First latex crêpe...\$0.55½@	\$0.45½	\$0.63 @	\$0.60½
Smoke sheet ribbed .54 @	.44½	.62 @	.59½
			.67 @
			\$0.66½
			.65
<b>PARAS:</b>			
Upriver, fine .....	.55½ @	.54½	.68 @
Upriver, coarse.....	.33 @	.32	.40 @
Islands, fine .....	.48 @	.47½	.59 @
Islands, coarse.....	.22 @	.21½	.27 @
Cametá .....	.22 @	.21½	.28 @
			.31 @
			.30

<sup>1</sup> Figured only to September 22.

## RECLAIMED RUBBER.

The dullness of the past summer is still continuing. Dealings are limited to routine needs with no disposition to anticipate future demands. The demand continues fair for reclaims for insulation purposes. The prices for stock reclaims remain fixed and firm.

## NEW YORK QUOTATIONS.

SEPTEMBER 25, 1919

Subject to change without notice.

Standard reclaims:

Floating .....	lb.	.30	@	.35
Friction .....	lb.	.25	@	.35
Mechanical .....	lb.	.11	@	.16
Red .....	lb.	.20	@	.25
Shoe .....	lb.	.15	@	.15 1/2
Tires, auto .....	lb.	.15	@	.16 1/2
truck .....	lb.	.11 1/2	@	.12 1/2
White .....	lb.	.22	@	.25

## THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During September there has been a fair demand for paper, mostly from out-of-town banks, and the best rubber names have been taken at 5 1/2 to 5 3/4 per cent, and those not so well known 6 to 6 1/4 per cent."

## WEEKLY RUBBER REPORT.

GUTHRIE &amp; CO., LIMITED, Singapore, report [July 31, 1919]:

At the weekly rubber auctions held yesterday and to-day, manufacturing interests were well represented, and there was a good demand for all grades. At the commencement of the sales, fine pale crepe realized up to 73 cents (two lots sold for 73 1/2 cents), while ribbed smoked sheet was readily taken up at up to 71 1/2 cents. On resuming to-day the demand did not appear to have fallen away to any appreciable extent, and closing prices were 73 cents for crepe and 70 cents for sheet.

Brown and dark crepe were in good demand at from 1 to 1 1/2 cents advance on last week's prices.

The quality cataloged was 1,022 tons, of which 899 tons were offered and 694 tons sold.

The following is the course of values:

	In Singapore, per Pound. <sup>1</sup>	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked.....	67 1/2c @ 71 1/2c	1/ 9 3/4 @ 1/ 10 3/4
Sheet, good ribbed smoked.....	65 @ 67	1/ 8 7/8 @ 1/ 9 3/4
Sheet, plain smoked.....	59 @ ..	1/ 7 1/2 @ ..
Crepe, fine pale.....	69 1/2 @ 73	1/ 10 3/4 @ 1/ 11 1/2
Crepe, good pale.....	60 1/2 @ 68 1/2	1/ 7 7/8 @ 1/ 10 1/2
Crepe, fine brown.....	55 @ 59 1/2	1/ 6 1/4 @ 1/ 7 1/2
Crepe, good brown.....	48 @ 54 1/2	1/ 4 3/4 @ 1/ 6 1/2
Crepe, dark.....	43 1/2 @ 50	1/ 3 @ 1/ 4 1/2
Crepe, bark.....	38 @ 45	1/ 1 1/2 @ 1/ 3 1/2

<sup>1</sup> Quoted in S. S. Currency—\$1 = \$0.567.

## BATAVIA RUBBER MARKET.

HERMANS, MARSMAN &amp; CO., Batavia, report [June 15—July 15, 1919].

The market showed some improvement during the last month and several big parcels changed hands. There was more demand for forward deliveries especially from the side of American buyers. The signing of peace caused only a small increase of prices. The market closed with the following quotations:

	In Batavia Per 1/2-kilo. <sup>1</sup> Gulden.	Equivalent Per 1/2-kilo in U. S. Currency.
Fine pale crepe.....	1.20	\$0.480
Prime smoked sheets.....	1.19	.476
Fine pale crepe, basis 75 per cent.....	1.08	.432
Off crepe.....	1.12	.448

<sup>1</sup> Quoted per 1/2-kilo (1.1 lb.) in Dutch Indian guilders (\$0.40).

## PLANTATION RUBBER EXPORTS FOR MALAYA.

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to March 31.	Jan. 1 to Feb. 28.	Totals.
To United Kingdom.....	12,561,200	17,665,125	33,738,725
The Continent.....	6,507,200	.....	6,507,200
Japan.....	8,122,800	211,200	8,334,000
Ceylon.....	50,000	844,024	894,024
United States and Canada.....	90,528,400	2,052,400	92,580,800
Australia.....	88,000	.....	88,000
China (Hong-kong).....	.....	.....	.....
Other Countries.....	64,800	.....	64,800
Totals.....	117,922,400	18,509,149	5,776,000
For the year 1918.....	225,100,000	837,600	12,479,200
For the year 1917.....	177,901,200	15,113,200	23,402,000
For the year 1916.....	135,535,954	7,167,346	3,660,840
For the year 1915.....	86,067,657	7,898,984	821,445
For the year 1914.....	43,534,177	5,218,379	2,052,620

(Compiled by Barlow &amp; Co., Singapore.)

## UNITED STATES CRUDE RUBBER IMPORTS FOR 1919 (BY MONTHS).

	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Manicoba and Matto Grosso.	Totals for 1919.	Totals for 1918.
January.....	4,906	2,141	2	114	72	...	7,235	16,084
February.....	14,079	2,701	489	100	87	...	17,456	13,108
March.....	23,680	3,808	337	211	187	...	28,223	17,161
April.....	24,678	2,794	90	144	330	110	28,146	13,425
June.....	15,645	1,706	264	263	390	51	16,319	24,124
July.....	17,645	121	16	82	101	...	17,965	16,092
August.....	8,221	2,594	137	74	41	...	11,067	10,421

(Compiled by The Rubber Association of America, Inc.)

## CEYLON RUBBER IMPORTS AND EXPORTS.

## IMPORTS.

	January 1 to July 28.	1918.	1919.
Crude rubber:			
From Straits Settlements.....	1,471,419	1,438,408	
India.....	1,519,467	768,826	
Burma and other countries.....	3,107	.....	
Totals.....	2,993,993	2,206,034	

## EXPORTS.

	January 1 to July 28.	1918.	1919.
To United Kingdom.....	10,144,711	17,694,924	
Belgium.....	.....	29,120	
France.....	100,642	330,010	
Victoria.....	504,189	98,755	
New South Wales.....	230,947	150,612	
United States.....	12,307,425	37,882,106	
Canada and Newfoundland.....	4,804,976	260,026	
India.....	2,329	2,313	
Straits Settlements.....	159,018	454	
Japan.....	.....	175,386	
Totals.....	28,254,237	56,623,786	

<sup>1</sup> These figures include cargoes for transshipment to New Zealand, other parts of Australia, and dependencies.

(Compiled by the Ceylon Chamber of Commerce.)

## PLANTATION RUBBER EXPORTS FROM JAVA.

	June:	1918.	1919.	Six Months Ended June 30.
To Holland.....	.....	57,000	179,100	
England.....	.....	134,000	3,815,000	
France.....	.....	.....	170,000	
United States.....	673,000	2,231,000	4,162,000	10,107,000
Canada.....	.....	.....	36,000	
Singapore.....	1,349,000	427,000	4,366,000	4,331,000
Japan.....	70,000	.....	634,000	179,000
Australia.....	.....	26,000	169,000	
Other countries.....	510,000	1,000	510,000	12,000
Totals.....	2,602,000	2,876,000	11,331,000	18,904,000
Ports of origin:				
Tandjong Priok.....	975,000	1,550,000	5,406,000	9,148,000
Samang.....	14,000	18,000	104,000	222,000
Soerabaya.....	1,149,000	1,159,000	5,357,000	7,487,000
Pilayap.....	.....	149,000	.....	149,000
Totals.....	2,138,000	2,876,000	10,867,000	17,006,000

## FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the July exports of rubber from the Federated Malay States amounted to 8,640 tons as compared with 7,094 tons in June, and 5,706 tons in the corresponding month last year. For seven months of the present year the export amounted to 59,357 tons against 46,263 tons in 1918, and 45,274 tons in 1917.

Appended are the comparative statistics:

	1917.	1918.	1919.
January.....	5,995	7,588	7,163
February.....	7,250	6,820	10,809
March.....	7,088	7,709	10,679
April.....	5,955	7,428	7,664
May.....	7,179	5,851	7,308
June.....	6,009	5,161	7,094
July.....	5,798	5,706	8,640
Totals.....	45,274	46,263	59,357

## STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of rubber from Straits Settlements ports in the month of July amounted to 7,818 tons (of which 135 tons were transshipments), which compares with 50,595 tons in June, and 1,978 tons in the corresponding month last year. The total for seven months of the present year is 90,543 tons, compared with 44,158 tons for the corresponding period in 1918, and 46,867 tons in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January.....	3,562	4,302	14,404
February.....	6,495	2,334	15,661
March.....	8,299	8,858	20,308
April.....	6,103	6,584	10,848
May.....	6,282	13,587	15,845
June.....	8,775	6,515	5,059
July.....	7,351	1,978	7,818
Totals.....	46,867	44,158	90,543



# CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

## PARAS AND CAUCHO AT NEW YORK.

	Pounds.					
	Fine.	Medium.	Coarse.	Cauch.	Mixed Rubber.	Total Pounds.
AUGUST 25. By the S. S. <i>Gregory</i> , from Manáos.						
Poel & Kelly.....	33,750	4,426	42,241			80,417
Pell & Dumout, Inc.....	9,570	3,795	24,140	62,220		86,360
H. A. Astlett & Co.....	5,940	660	480			7,080
Alden's Successors, Inc.....			20,899			20,899
G. Amsinck & Co., Inc.....	12,343	990	6,240	29,920		39,493
A. Souza.....	9,570	3,795	1,860	38,420		53,645
Cowdy & Co.....	26,730	1,980	3,840	9,180		41,730
Various.....	154,440	25,410	9,600	125,800		315,250
AUGUST 21. By the S. S. <i>Benedict</i> , from Manáos.						
Poel & Kelly.....	217,051	28,838	79,433	3,956	# 8,543	337,821
Raw Products Co.....			220		#2,558	57,200
Meyer & Brown, Inc.....	63		240	401		222,678
General Rubber Co.....	341	2	229,211	229,140		3,133,480
H. A. Astlett & Co.....	314	4	154	259		268,171
Winter, Ross & Co.....	1		2	120		42,750
G. Amsinck & Co., Inc.....	1620		930	939		68,422
W. R. Grace & Co.....				26		9,152
Gaston, Williams & Wigmore.....	166	12				65,970
Neuhaus, Hesselein & Co.....					#398	54,182
Various.....	1,041	148	101	135		502,757
AUGUST 22. By the S. S. <i>Byron</i> , from Pará.						
General Rubber Co.....						130,448
G. Amsinck & Co., Inc.....	44,860	4,480	6,720			56,000
Gaston, Williams & Wigmore.....	15,500					15,500
H. A. Astlett & Co.....						147,808
SEPTEMBER 5. By the S. S. <i>Gen. O. H. Ernst</i> , from Cristobal.						
G. Amsinck & Co., Inc.....				1,020		1,020
SEPTEMBER 16. By the S. S. <i>Cuthbert</i> , from Pará, Manáos and Equitos.						
Meyer & Brown, Inc.....	63,200		13,800		#24,700	101,700
Fred Stern & Co.....			22,342			22,342
Alden's Successors, Inc.....	7,496	6,912	6,225			20,638
#F. R. Henderson & Co.....		15	272	98	#838	111,600
#H. A. Astlett & Co.....	1,354	230	525	2,423		1,365,795
#Gaston, Williams & Wigmore.....	458	27	115	33		271,367
#General Rubber Co.....	586	75	236	291		444,500
#Poel & Kelly.....	275	58	130	12		164,680
#Raw Products Co.....	66					232,166
#G. Amsinck & Co., Inc.....	23	2		163		62,306
Wm. Schall & Co.....	1476					519,618
#Hagemeier & Brunn	306					114,444
#Commercial Bank of Spanish America.....	1	40	7	10		25,632
SEPTEMBER 17. By the S. S. <i>Manco</i> , from Manáos and Pará.						
#H. A. Astlett & Co.....	218	112	1,164	858		734,153
#General Rubber Co.....			42			22,000
#Paul Bertuch.....	163	134	230			774,227
#G. Amsinck & Co., Inc.....	296					128,788
#Poel & Kelly.....	337	254	120	260		159,289
#Winter, Ross & Co.....			4	121		3,914
#E. T. Greiner.....	93	53	40	20		69,095
#Hagemeier & Brunn	307		1	1		114,600

<sup>1</sup>Including 1 case, coarse and fine.

<sup>2</sup>Cameta.

<sup>3</sup>Packages.

<sup>4</sup>Bales.

<sup>5</sup>Including cases, bags and bales.

<sup>6</sup>Cases and bales.

<sup>7</sup>Fine and medium.

<sup>8</sup>Cameta.

<sup>9</sup>Islands coarse.

<sup>10</sup>Cases.

<sup>11</sup>Packages weighing 41,160 lbs.

<sup>12</sup>Packages.

## PLANTATIONS.

(Figured 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
AUGUST 19. By the S. S. <i>Arabia Maru</i> , at Tacoma. <sup>12</sup>				
F. R. Henderson & Co.....	Singapore	New York	255,420	
Thos. A. Desmond & Co.....	Singapore	New York	44,820	
				300,240
AUGUST 21. By the S. S. <i>Anglo Chilean</i> , at New York.				
R. F. Downing & Co.....	London	New York	81,180	
Vernon Metal & Produce Co.....	London	New York	43,200	
				124,380
AUGUST 21. By the S. S. <i>Niagara</i> , at New York.				
A. Salomon, Inc.....	Bordeaux	New York	239,040	
Rubber Importers & Dealers Co.....	Bordeaux	New York	180,360	
A. D. Straus & Co., Inc.....	Bordeaux	New York	72,680	
				492,080

<sup>12</sup> Ex. *Osaka Shosen Kaisha*, from Yokohama.

	Shipment from:	Shipped to:	Pounds.	Totals.
AUGUST 25. By the S. S. <i>Stanley Dollar</i> , at San Francisco.				
The B. F. Goodrich Co.....	Singapore	San Francisco	578,160	
J. T. Johnstone & Co., Inc.....	Batavia	San Francisco	344,960	
Rubber Trading Co.....	Singapore	San Francisco	100,800	
McAllister Bros.....	Singapore	San Francisco	94,500	
L. Littlejohn & Co., Inc.....	Singapore	San Francisco	112,000	
Winter, Ross & Co.....	Batavia	San Francisco	69,160	
F. R. Henderson & Co.....	Batavia	San Francisco	76,140	
The Goodyear Tire & Rubber Co.....	Batavia	San Francisco	58,680	
Francis Peck & Co., Ltd.....	Batavia	San Francisco	44,280	
				1,578,680

AUGUST 25. By the S. S. <i>Empress of Asia</i> , via Hongkong at Vancouver.				
F. R. Henderson & Co.....	Singapore	Vancouver	209,340	
Federal Export Corp.....	Singapore	Vancouver	126,540	
Adolph Hirsch & Co.....	Singapore	Vancouver	41,040	
				376,920

AUGUST 30. By S. S. <i>Bloomfontein</i> , at New York.				
Curry, McPhillips & Co.....	Hull	New York	26,460	26,460

SEPTEMBER 1. By the S. S. <i>Navarine</i> , at New York.				
F. R. Downing & Co.....	London	New York	57,600	
L. Littlejohn & Co., Inc.....	London	New York	10,260	
Various.....	London	New York	2,700	
				70,560

SEPTEMBER 1. By the S. S. <i>Suzzi</i> , at New York.				
Meyer & Brown, Inc.....	London	New York	3,586,680	
L. Littlejohn & Co., Inc.....	Colombo	New York	305,475	
Poel & Kelly.....	Calcutta	New York	5,800	
				3,897,955

SEPTEMBER 2. By the S. S. <i>Siberia Maru</i> , at San Francisco. <sup>13</sup>				
Bowers Rubber Works.....	Singapore	San Francisco	9,720	9,720

<sup>13</sup> Ex. S. S. *Hiayang*, via Singapore.

SEPTEMBER 3. By the S. S. <i>Suwa Maru</i> , at Seattle. <sup>14</sup>				
The Goodyear Tire & Rubber Co.....	Singapore	Akron	28,800	
Various.....	Singapore	Seattle	9,000	
				37,800

<sup>14</sup> Ex. *Nippon Yusen Kaisha*, steamer from Yokohama.

SEPTEMBER 5. By the S. S. <i>Edgemont</i> , at New York.				
Adolph Hirsch & Co.....	London	New York	12,240	12,240

SEPTEMBER 8. By the S. S. <i>Euryades</i> , at New York.				
J. T. Johnstone & Co., Inc.....	Deli	New York	529,760	
J. T. Johnstone & Co., Inc.....	Singapore	New York	27,720	
William H. Stiles & Co.....	Singapore	New York	64,440	
William H. Stiles & Co.....	Port Dickson	New York	20,520	
L. Littlejohn & Co., Inc.....	Singapore	New York	2,240,000	
Hadden & Co.....	Singapore	New York	244,080	
Hadden & Co.....	Deli	New York	17,280	
Poel & Kelly.....	Singapore	New York	230,040	
Poel & Kelly.....	Port Dickson	New York	25,200	
Poel & Kelly.....	Port Swett'ham	New York	6,120	
Poel & Kelly.....	Penang	New York	1,800	
Edward Maurer Co., Inc.....	Singapore	New York	161,280	
A. C. Harper & Co.....	Port Swett'ham	New York	158,760	
Thos. A. Desmond & Co.....	Singapore	New York	103,320	
Winter, Ross & Co.....	Deli	New York	103,140	
Winter, Ross & Co.....	Singapore	New York	54,720	
Winter, Ross & Co.....	Tuluk Anson	New York	6,120	
United Malaysian Rubber Co., Ltd.....	Singapore	New York	100,800	
Mexican Crude Rubber Co.....	Port Swett'ham	New York	72,000	
H. R. Jeffords.....	Port Swett'ham	New York	2,520	
Fred. Stern & Co.....	Singapore	New York	56,000	
Various.....	Singapore	New York	86,240	
				4,326,980

SEPTEMBER 11. Ex. S. S. <i>Hong Bee</i> , at San Francisco. <sup>15</sup>				
Thos. A. Desmond.....	Hongkong	New York	71,640	
Charles T. Wilson Co., Inc.....	Hongkong	San Francisco	40,320	
				111,960

<sup>15</sup> Ex. S. S. *Shingo Maru*, from Hongkong.

SEPTEMBER 12. By the S. S. <i>Colombia</i> , at San Francisco.				
Thos. A. Desmond & Co.....	Hongkong	New York	44,820	
Fred Stern & Co.....	Singapore	San Francisco	112,050	
				156,870

SEPT. 15. By the S. S. <i>Harlem</i> , at New York.				
Various.....	Bordeaux	New York	2,880	2,880

SEPTEMBER 15. By the S. S. <i>Aquitania</i> , at New York.				
Poel & Kelly.....	Southampton	New York	123,200	123,200

SEPTEMBER 15. By the <i>City of Shanghai</i> , at New York.				
L. Littlejohn & Co., Inc.....	Colombo	New York	102,060	
J. T. Johnstone & Co., Inc.....	Colombo	New York	82,240	
Various.....	Colombo	New York	11,880	
				196,180

SEPTEMBER 16. By the S. S. <i>Cretic</i> , at New York.				
Rubber Trading Co.....	Liverpool	New York	720	
Fred. Stern & Co.....	Liverpool	New York	24,600	
Curry, McPhillips & Co.....	Liverpool	New York	107,360	
				132,680

	Shipped from:	Shipped to:	Pounds.	Totals.
SEPT. 16. By S. S. <i>Orduna</i> , at New York.				
Poel & Kelly.....	Liverpool	New York	250,880	
General Rubber Co.....	Liverpool	New York	39,600	
Meyer & Brown, Inc.....	Liverpool	New York	11,200	
L. Littlejohn & Co., Inc.	Liverpool	New York	1,620	
				303,300
SEPT. 16. By the S. S. <i>Minnehaha</i> , at New York.				
The Goodyear Tire & Rubber Co. ....	London	New York	94,840	
Various .....	London	New York	43,200	
				138,040
SEPT. 16. By the S. S. <i>Tan Overstraten</i> , at New York.				
General Rubber Co.....	Asahan	New York	1,847,520	
J. T. Johnstone & Co., Inc. ....	Belawan	New York	39,100	
Aldens' Successors, Inc.	Belawan	New York	33,415	
The Goodyear Tire & Rubber Co. ....	Medan	Akron	295,380	
G. Amsinck & Co., Inc..	Belawan	New York	219,600	
Poel & Kelly.....	Belawan	New York	105,280	
Peninsular Trading Co.	Asahan	New York	93,240	
Peninsular Trading Co.	Belawan	New York	22,800	
Gaston, Williams & Wigmore .....	Belawan	New York	68,760	
Pablo Homs.....	Belawan	New York	55,440	
L. Littlejohn & Co.....	Belawan	New York	33,600	
				2,814,135
BALATA.				
AUG. 21. By the S. S. <i>Advance</i> , at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	4,350	
Holtrane Co., Inc.....	Cristobal	New York	2,700	
				7,050
AUG. 27. By the S. S. <i>Oranje Nassau</i> , at New York.				
Middleton & Co.....	Paramaribo	New York	11,550	
Wm. Schall & Co.....	Paramaribo	New York	7,200	
Willard Hawes & Co....	Paramaribo	New York	1,500	
				20,250
AUG. 27. By the S. S. <i>W. K. Tupper</i> , at New York.				
Sorenson & Nielson....	Colon	New York	600	
Meeke & Co.....	Colon	New York	300	
				900
SEPT. 5. By the S. S. <i>Gen. O. H. Ernst</i> , at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	17,550	
Pablo, Calvet & Co....	Cristobal	New York	4,800	
Antioquia Comm's corp..	Cristobal	New York	3,000	
Neusa, Heaslein & Co...	Cristobal	New York	1,350	
				26,700
SEPT. 6. By the S. S. <i>Prins der Nederlanden</i> , at New York.				
Middleton & Co.....	Saint Marc	New York	6,600	
				6,600
SEPT. 8. By the S. S. <i>Maraval</i> , at New York.				
South & Central American Comm'l Co. ....	Granda	New York	12,360	
				12,360
SEPT. 15. By the S. S. <i>Colon</i> , at New York				
G. Amsinck & Co., Inc..	Cristobal	New York	8,400	
American Trading Co. ..	Cristobal	New York	6,900	
W. Reed, Williams, Inc.	Cristobal	New York	3,300	
Fidanque Bros. & Sons..	Cristobal	New York	1,800	
Cook & Bernheimer Co...	Cristobal	New York	1,200	
Piza, Nephews & Co....	Cristobal	New York	450	
				22,050
CENTRALS.				
AUG. 21. By the S. S. <i>Stavangeren</i> , at New York.				
Southern Sales corporation .....	Ciudad Bolivar	New York	27,100	
				27,100
AUG. 21. By the S. S. <i>Advance</i> , at New York.				
Pablo, Calvet & Co....	Cristobal	New York	11,900	
Gaston, Williams & Wigmore .....	Cristobal	New York	10,200	
T. S. Sembrada & Co....	Cristobal	New York	7,700	
American Trading Co..	Cristobal	New York	7,600	
G. Amsinck & Co., Inc..	Cristobal	New York	6,800	
W. R. Grace & Co.....	Cristobal	New York	3,100	
A. M. Capens' Sons.....	Cristobal	New York	2,500	
				49,800
AUG. 25. By the S. S. <i>Lulu</i> , at New York.				
R. Desvernine .....	Venezuela	New York	100	
				100
AUG. 29. By the S. S. <i>Lake Wilson</i> , at New York.				
Thos. A. Crane's Sons..	Cristobal	New York	3,800	
J. S. Sembrada & Co....	Cristobal	New York	1,700	
				5,500
SEPT. 1. By the S. S. <i>Mohegan</i> , at New York.				
Sorenson & Nielsen....	Cartagena	New York	3,000	
American Trading Co....		New York	1,900	
				4,900
SEPT. 5. By the S. S. <i>Charlton Hall</i> , at New York.				
David L. Moss & Co., Montevideo		New York	10,200	
SEPT. 5. By the S. S. <i>Gen. H. F. Hodges</i> , at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	4,600	
Various .....	Cristobal	New York	100	
				4,700
(Continued on page 62.)				

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF JULY, 1919.

EXPORTERS.	NEW YORK.					EUROPE.					GRAND TOTALS.
	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	
General Rubber Co. of Brazil <i>kilos</i> .....						89,440	10,560			100,000	100,000
Tancredo, Porto & Co. ....	33,846	3,628	4,779	9,747	52,000	26,989	.....	2,411	11,600	41,000	93,000
T. G. Araujo .....						57,784		2,288		60,072	60,072
Higson & Fall .....						17,877	1,599	484		19,949	19,949
A. Souza .....	3,358	419	288	15,660	19,725						19,725
Chase Import & Export Corporation .....	16,577	1,130	1,153		18,860						18,860
B. Lévy & Co. ....						2,045	177	7,560	3,420	13,202	13,202
Stowell & Co. ....			4,070		4,070			3,656		3,656	7,726
Armazens Andresen .....						996	3,267	1,011	1,124	6,398	6,398
F. Salles Vieira .....	1,094	26	600	300	2,020						2,020
Total, Manáos .....	54,875	5,203	10,890	25,707	96,675	195,131	15,592	17,410	16,144	244,277	340,952
In transit, Iquitos .....	1,528	13,629	17,907	19,390	52,454	1,413	6,268	1,728	17,429	26,838	79,292
Totals .....	56,403	18,832	28,797	45,097	149,129	196,544	21,860	19,138	33,573	271,115	420,244

(Compiled by Stowell & Co., Manáos, Brazil.)

EXPORTS OF INDIA RUBBER FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF AUGUST, 1919.

EXPORTERS	TO NEW YORK.					TO EUROPE.					GRAND TOTALS.
	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	
Stowell & Co. .... kilos	5,798	3,447	25,959	1,817	37,021	109,591	3,180	3,168	.....	115,939	152,960
Saurez Filho & Co. ....	26,292	.....	9,564	75,483	118,339	19,408	.....	.....	20,321	39,729	151,068
General Rubber Co. ....	34,170	2,506	31,499	30,319	98,494	1,775	75	77	30,462	32,389	130,883
Alfredo Valhe & Co. ....	11,900	1,766	.....	.....	13,666	17,154	.....	12,068	30,190	59,412	73,078
Bitar Iruños. ....	1,280	480	160	44,320	46,240	.....	.....	.....	20,800	20,800	67,040
T. Chamie .....	20,400	.....	15,120	15,000	50,520	.....	.....	.....	.....	50,520	50,520
J. Marquez .....	16,320	.....	23,760	.....	40,080	.....	.....	.....	.....	40,080	40,080
Berringer & Co. ....	20,577	2,072	1,487	964	25,100	.....	.....	.....	.....	.....	25,100
Ad. H. Alden, Ltd. ....	.....	.....	.....	.....	.....	.....	.....	.....	13,198	13,198	13,198
Ferreira, Costa & Co. ....	6,800	510	.....	.....	7,310	.....	.....	.....	.....	.....	7,310
C. Zencovich .....	.....	.....	.....	.....	.....	5,440	.....	.....	.....	5,440	5,440
Sundries .....	34,935	958	14,521	33,149	83,563	34,665	4,166	2,612	7,710	49,153	132,716
From Pará .....	178,472	11,739	122,070	201,052	513,333	188,033	7,421	17,925	122,681	336,060	849,393
From Manaós .....	462,654	88,869	170,133	248,939	970,595	472,813	47,490	11,612	40,898	572,813	1,543,408
From Iquitos .....	.....	.....	.....	.....	.....	11,535	.....	1,388	64,017	76,940	76,940
Totals .....	641,126	100,608	292,203	449,991	1,483,928	672,381	54,911	30,925	227,596	985,813	2,469,741

(Compiled by Stowell & Co., Pard, Brazil.)

	Shipped from:	Shipped to:	Pounds.	Totals.
SEPT. 5. By the S. S. <i>Gem. O. H. Ernst</i> , at New York.	Cristobal	New York	15,300	
J. S. Sembrada & Co....	Cristobal	New York	3,900	
Pablo, Calvet & Co....	Cristobal	New York		
Balfour, Williamson & Co. ....	Cristobal	New York	2,400	
Various .....	Cristobal	New York	1,400	23,000
SEPT. 11. By the S. S. <i>Tredres</i> , at New York.	Cartagena	New York	3,500	3,500
Sorenson & Nielsen.....				
SEPT. 15. By the S. S. <i>Colon</i> , at New York.	Cristobal	New York	6,900	
Piza, Nephews & Co....	Cristobal	New York	1,600	8,500
Fidanque Bros. & Sons..				
SEPT. 16. By the S. S. <i>Caracas</i> , at New York.	Caracas	New York	4,200	4,200
Commercial Bank of Spanish America.....				
SEPT. 17. By the S. S. <i>Alamo</i> , at New York.	Cartagena	New York	5,300	
Andean Trading Co....				
Commercial Bank of Spanish America.....	Cartagena	New York	700	6,000
SEPT. 17. By the S. S. <i>Zecapa</i> , at New York.	Cristobal	New York	200	200
Isaac Brandon & Bros..				
SEPT. 15. By the S. S. <i>Morro Castle</i> , at New York.	Tampico	New York	1,000	
General Exp. of Comm. Co. ....	Tampico	New York	6,500	7,500
Fanfan & Kemp.....				

## MANICOBAS.

SEPT. 11. By the S. S. <i>Opequan</i> , at New York.	Bakia	New York	180,400	180,400
T. Blumenthal Co.....				

## PONTIANAK.

SEPT. 8. By the S. S. <i>Euryades</i> , at New York.	Singapore	New York	242,700	
L. Littlejohn & Co., Inc.				
United Malaysian Rubber Co., Ltd.....	Singapore	New York	209,100	
Sukuki & Co.....	Singapore	New York	166,800	
Edward Boustead & Co.,	Singapore	New York	129,300	
East Asiatic Co.....	Singapore	New York	125,400	
Yaeger & Co., Ltd.....	Singapore	New York	118,500	
Fred Stern & Co.....	Singapore	New York	15,680	1,007,480

## AFRICANS.

SEPT. 4. By the S. S. <i>Gothland</i> , at New York.	Antwerp	New York	3,880	3,880
Curry, McPhillips & Co..				
SEPT. 15. By the S. S. <i>Harlem</i> , at New York.	Bordeaux	New York	151,110	151,110
Rubber Importers & Dealers Co. ....				
SEPT. 17. By the S. S. <i>Thonga</i> , at New York.	Sierre Leone	New York	54,970	54,970
Niger Company, Ltd....				

<sup>1</sup> Water flake.

## GUAYULE.

AUG. 27. By rail to Eagle Pass.	Akron, Ohio		78,150	78,150
Continental Mexican Rubber Co. ....				

## RUBBER STATISTICS FOR THE DOMINION OF CANADA.

## IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	June.			
	1918.	1919.		
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—free:				
Rubber, gutta percha, etc.:				
From United Kingdom ....	22,909	\$14,036	140,165	\$62,953
United States .....	836,107	406,773	442,023	195,618
British East Indies:				
Ceylon .....	383,360	178,117	45,472	42,630
India .....				
Straits Settlements..	734,013	314,001	398,561	188,084
Other countries .....				
Totals .....	1,976,389	\$942,932	1,026,221	\$489,235
Rubber, recovered .....	172,166	31,453	211,019	38,417
Hard rubber sheets and rods..	2,605	2,053	35,695	6,674
Hard rubber tubes.....		536		1,437
Rubber, powdered, and rubber or gutta percha scrap.....	341,621	28,192	124,287	18,963
Rubber thread, not covered..	3,795	5,521	1,001	1,474
Rubber substitute .....	107,419	11,182	100,228	6,984
Totals .....	1,976,389	\$942,932	1,026,221	\$489,235
Chicle .....	166,574	\$106,818	183,039	\$137,202
MANUFACTURED—dutiable:				
Boots and shoes.....		\$11,979		\$16,770
Waterproofed clothing .....		11,611		20,624
Belting, hose and packing.....		46,164		23,590
Gloves and hot-water bottles..		( <sup>1</sup> )		2,297
Tires .....		149,592		140,406
Other manufactures .....		157,531		168,904
Totals .....		\$376,877		\$372,591

## EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	June.			
	1918.		1919.	
	Produce of Canada.	Re-exports of Foreign Goods.	Produce of Canada.	Re-exports of Foreign Goods.
	Value.	Value.	Value.	Value.
UNMANUFACTURED—				
Crude and waste rubber...				\$6,835
MANUFACTURED—				
Hose .....	\$13,175		\$1,695	
Boots and shoes.....	76,653		45,846	839
Clothing .....	201		10,570	
Tires .....	37,759	331	396,583	5,731
Waste .....	1,604		27,908	
Belting .....	232		997	
All other—n. o. p.....	5,774	15,983	15,720	2,657
Chicle .....	\$135,398	\$16,314	\$499,319	\$16,062
	145,769		73,737	

<sup>1</sup> Included in "Other manufactures."

## UNITED KINGDOM RUBBER STATISTICS.

## IMPORTS.

	July.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies.....	23,400	£2,513	2,956,800	£292,490
French West Africa.....				
Gold Coast .....	177,300	9,116	32,600	3,048
Other African countries..	1,103,700	113,919	97,100	8,894
Peru .....			137,300	14,800
Brazil .....	33,600	4,200	291,900	36,336
British India .....	431,900	48,042	161,800	15,550
Straits Settlements and dependencies, including Labuan .....				
Federated Malay States..	2,947,100	325,634	3,864,900	375,381
Ceylon and dependencies..	2,375,800	278,003	4,660,100	434,701
Other countries .....	1,574,100	181,945	1,749,900	167,026
	1,300	170	539,300	51,791
Totals .....	8,668,100	£963,542	14,491,700	£1,400,017
Waste and reclaimed rubber.	2,200	25	611,200	16,480
Totals, unmanufactured	8,670,300	£963,567	15,102,900	£1,416,497
Gutta percha .....	453,800	£73,748	208,800	£34,692
MANUFACTURED—				
Boots and shoes..dozen pairs	211	£2,435	9,412	£17,221
Waterproofed clothing.....				650
Automobile tires and tubes.		57,529		255,167
Motorcycle tires and tubes.				1,865
Bicycle tires and tubes.....		1,510		2,948
Carriage tires and tubes....				274
Insulated wire .....				558
Totals .....	211	£61,469	9,412	£278,683

## EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber	782,800	£17,747	1,192,400	£31,650
MANUFACTURED—				
Waterproofed clothing.....		40,762		117,824
Boots and shoes..dozen pairs	41,916	215,678	46,884	340,926
Insulated wire .....		4,113		88,752
Submarine cables.....		23,300		107,265
Carriage tires and tubes....		12,770		17,016
Automobile tires and tubes.		92,326		166,034
Motorcycle tires and tubes.		31,035		11,890
Bicycle tires and tubes.....		18,515		119,418
Other rubber manufactures.		124,558		214,955
Totals .....		£580,804		£1,215,430

## EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED—				
Crude rubber:				
To Belgium .....			772,600	£61,244
France .....	1,452,200	£157,020	763,700	71,576
Italy .....	649,300	69,563	408,200	35,412
Russia .....			22,400	3,500
United States .....	46,700	4,000	1,046,200	78,449
Other countries.....	310,800	35,630	1,856,700	190,081
Totals .....	2,459,000	£266,213	4,869,800	£446,262
Waste and reclaimed rubber.				
Gutta percha .....	27,400	3,093	170,200	24,868
MANUFACTURED—				
Boots and shoes..dozen pairs				
Insulated wire .....		£97		
Automobile tires and tubes.		3,338		£7,740
Motorcycle tires and tubes.		50		1,498
Bicycle tires and tubes.....		1,028		8
Carriage tires and tubes....		98		19
Totals .....		£4,606		£8,264



**EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JULY, 1919.**

EXPORTED TO—	Belting Hose and Packing. Value.	Boots.		Shoes.		Druggists' Rubber Sundries. Value.	Tires.		Insulated Wire and Cable. Value.	All Other Rubber Manu- factures. Value.	Totals. Value.
		Pairs.	Value.	Pairs.	Value.		Auto- mobile. Value.	All Others. Value.			
<b>EUROPE:</b>										\$17	\$26
Austria-Hungary						\$9					
Belgium		62	\$132			1,325	\$28,374		\$8,909	1,929	40,669
Denmark	\$4,931	2,704	5,015	2,640	\$1,882	868	101,230	\$970	6,445	9,925	131,273
Finland	5,962										5,962
France	8,890					2,205	111,024		8,398	60,779	191,296
Gibraltar				1,320	1,230		175				1,405
Greece		1	5				542		3,176	529	4,252
Iceland and Faroe Islands	387	1,241	3,644	8,912	7,233	116	1,093		98	2,516	15,137
Italy				9,528	6,514		55,808		489	1,679	64,290
Netherlands	18,199					2,091	27,586		71,388	2,273	121,537
Norway	6,600	1,018	1,864	18,240	11,830	486	54,730	1,898	224,233	9,651	311,292
Portugal							565	2,520	981	150	4,216
Spain	4,849					5	14,008		1,749	1,691	22,302
Sweden	60,026			528	466	1,113	150,970		2,541	8,560	223,676
Switzerland						2				140	142
England	13,986	228	409	8,326	5,279	7,209	102,453	6,000	12,831	95,048	243,215
Scotland							150				150
<b>TOTALS, EUROPE</b>	<b>\$123,830</b>	<b>5,254</b>	<b>\$11,069</b>	<b>49,494</b>	<b>\$34,291</b>	<b>\$15,429</b>	<b>\$648,708</b>	<b>\$11,388</b>	<b>\$341,238</b>	<b>\$194,887</b>	<b>\$1,380,840</b>
<b>NORTH AMERICA:</b>										\$5	\$218
Bermuda	\$129	12	\$33			\$1	\$50			50	3,902
British Honduras	129			1,260		14	2,374	\$3			
Canada	32,537	1,493	5,441	3,219	3,081	14,381	78,192	3,157	\$10,427	136,418	283,634
Costa Rica	139					65	1,190	138	142	15	1,689
Guatemala	439			720	827		40			210	1,516
Honduras	244			354	386	175	5,762	121	1,579	129	8,396
Nicaragua	802					176	3,353	87	6	2,051	6,475
Panama	7,079			1,935	1,546	454	44,184	1,828	22,311	2,187	79,589
Salvador						277	9,645	2	1,049	5,160	16,133
Mexico	65,944	38	142	2,174	1,936	7,931	42,643	3,751	23,126	19,364	164,887
Miqueion, Langley, etc.		1,524	4,981								4,987
Newfoundland and Labrador	769	4,022	10,944	5,263	5,183		2,125	39	2,503	2,281	23,844
Barbados		24	33	96	76	72	1,272			145	1,648
Jamaica	1,547			418	480	139	5,899		127	616	8,808
Trinidad and Tobago	382						3,094		527	232	4,235
Other British West Indies	57				354		239			6	656
Cuba	26,187	4	20	6,627	4,655	4,027	102,807	3,660	39,634	12,177	193,167
Danish West Indies						71	2,082			37	2,190
Dutch West Indies							240		187	5	432
French West Indies	347						4,907	42		92	5,373
Haiti	215			60	58		1,394		136	329	2,174
Dominican Republic	460					800	5,554	296	1,188	1,655	9,955
<b>TOTALS, NORTH AMERICA</b>	<b>\$137,406</b>	<b>7,177</b>	<b>\$21,594</b>	<b>22,611</b>	<b>\$19,964</b>	<b>\$28,583</b>	<b>\$317,046</b>	<b>\$13,157</b>	<b>\$102,992</b>	<b>\$183,164</b>	<b>\$823,906</b>
<b>SOUTH AMERICA:</b>											
Argentina	\$4,251			24	\$24	\$9,435	\$130,961		\$19,456	\$10,337	\$174,464
Bolivia	710						353	\$32	186	94	1,375
Brazil	17,345			11,738	10,043	6,361	75,024	267	75,408	7,088	191,536
Chile	14,758			600	636	4,350	14,293	8,340	19,462	9,519	71,360
Colombia	2,346					604	3,741		4,093	1,456	12,240
Ecuador	853	36	\$126	1,242	1,294	33	2,695		552	62	5,615
British Guiana	3						1,860		577	576	3,016
Paraguay	163										163
Peru	8,497					73	21,354	46	4,620	1,406	35,996
Uruguay	2,305	525	507	3,024	1,962	2,123	51,484		18,417	5,650	82,448
Venezuela	2,767					2,064	12,291	61	916	1,701	19,800
<b>TOTALS, SOUTH AMERICA</b>	<b>\$53,998</b>	<b>561</b>	<b>\$633</b>	<b>16,628</b>	<b>\$13,961</b>	<b>\$25,043</b>	<b>\$314,056</b>	<b>\$8,746</b>	<b>\$143,687</b>	<b>\$37,889</b>	<b>\$598,013</b>
<b>ASIA:</b>											
China	\$6,538	13	\$46	223	\$235	\$956	\$18,079	\$301	\$995	\$8,630	\$35,780
Chosen	1,568				129	1,165	2,252		14,710	2,239	1,566
British India	1,237			186			20,066		254	1,146	21,493
Straits Settlements						27	4,270			9	4,279
Other British East Indies							69,933	2,388	22,666	3,009	100,899
Dutch East Indies	2,903									14	14
French East Indies					47		1,049		198	82	6,384
Hongkong	4,478	180	530	60	4,865		608			382	6,723
Japan	223	264	647	5,360	23,878	343	1,042			1,201	47,246
Russia in Asia	572	5,901	22,210	20,149		57	405				1,087
Siam	625										
<b>TOTALS, ASIA</b>	<b>\$18,144</b>	<b>6,358</b>	<b>\$21,433</b>	<b>25,978</b>	<b>\$29,152</b>	<b>\$2,548</b>	<b>\$117,704</b>	<b>\$2,689</b>	<b>\$38,823</b>	<b>\$16,712</b>	<b>\$247,205</b>
<b>OCEANIA:</b>											
Australia	\$18,593			8,177	\$6,047	\$679	\$52,749	\$209	\$6,766	\$7,036	\$92,079
New Zealand	917	897	\$3,898			113	47,863	119	4,040	9,983	66,973
Other British Oceania							50	155		15	220
French Oceania	100						1,127	340		160	1,727
German Oceania							522	122		6	650
Philippine Islands	12,633			5,359	7,859	2,176	47,290	1,686	21,385	16,578	109,607
<b>TOTALS, OCEANIA</b>	<b>\$32,243</b>	<b>897</b>	<b>\$3,898</b>	<b>13,536</b>	<b>\$13,906</b>	<b>\$2,968</b>	<b>\$149,601</b>	<b>\$2,631</b>	<b>\$32,231</b>	<b>\$33,778</b>	<b>\$271,256</b>
<b>AFRICA:</b>											
British West Africa	\$1,432				\$3,162		\$11,664	\$35			\$12,531
British South Africa	30,044	208	\$779	3,165		\$143	11,306		\$547	\$7,582	\$5,563
British East Africa										200	200
Canary Islands							500				500
French Africa	620	1	3			5		120	375		1,118
German Africa						14	32			12	17
Liberia										3	49
Portuguese Africa	2,660									104	2,764
<b>TOTALS, AFRICA</b>	<b>\$34,756</b>	<b>209</b>	<b>\$782</b>	<b>3,165</b>	<b>\$3,162</b>	<b>\$162</b>	<b>\$22,902</b>	<b>\$155</b>	<b>\$922</b>	<b>\$7,901</b>	<b>\$70,742</b>
<b>TOTALS</b>	<b>\$400,377</b>	<b>20,396</b>	<b>\$59,409</b>	<b>131,412</b>	<b>\$114,436</b>	<b>\$74,733</b>	<b>\$1,570,017</b>	<b>\$38,766</b>	<b>\$659,893</b>	<b>\$474,331</b>	<b>\$3,301,062</b>
<b>SHIPMENTS TO NON-CONTIGUOUS TERRITORY.</b>											
Hawaii	\$6,740						\$43,811	\$1,841		\$11,333	
Porto Rico	3,761						132,865	1,348		21,754	
<b>TOTALS</b>	<b>\$10,501</b>						<b>\$176,676</b>	<b>\$3,189</b>		<b>\$33,087</b>	<b>\$223,453</b>

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

## THE MARKET FOR RUBBER SCRAP.

## NEW YORK.

DEALINGS in scrap rubber for the month passed has been without activity or notable incident. There is no foreign movement of scrap either import or export.

Market conditions have not met the anticipations of the dealers as regards revival of the trade. The upward tendency of crude rubber has had no effect upon either the scrap or the reclaimed rubber markets.

BOOTS AND SHOES.—The demand has been intermittent and prices steady.

TIRES.—Buying demand has been fair, mostly for picking purposes. Prices have been steady and firm for good stock.

INNER TUBES.—The situation continues without interest.

## QUOTATIONS FOR CARLOAD LOTS DELIVERED.

September 25, 1919.

Prices subject to change without notice.

## BOOTS AND SHOES:

Arctic tops .....	lb.	.01	@
Boots and shoes .....	lb.	.08½	@
Trimmed arctics .....	lb.	.06½	@ .06¾
Untrimmed arctics .....	lb.	.05½	@

## HARD RUBBER:

Battery jars, black compound .....	lb.	.01	@
No. 1, bright fracture .....	lb.	.23	@ .24

## INNER TUBES:

No. 1, old packing .....	lb.	.19	@ .20
No. 2 .....	lb.	.10½	@ .10¾
Red .....	lb.	.10	@ .10½

## MECHANICALS:

Black scrap, mixed, No. 1 .....	lb.	.03½	@ .04
No. 2 .....	lb.	.03	@
Car springs .....	lb.	.03½	@ .04
Heels .....	lb.	.03	@ .03½
Horse-shoe pads .....	lb.	.03	@ .03½
Hose, air brake .....	lb.	.04½	@
fire, cotton lined .....	lb.	.01½	@ .01¾
garden .....	lb.	.01½	@ .01¾
Insulated wire stripping, free from fiber .....	lb.	.03½	@ .04
Matting .....	lb.	.01½	@ .01¾
Red packing .....	lb.	.05½	@ .06
Red scrap, No. 1 .....	lb.	.09	@ .10
No. 2 .....	lb.	.06½	@ .07¾
White scrap, No. 1 .....	lb.	.10	@ .11
No. 2 .....	lb.	.08	@ .09

## TIRES:

## PNEUMATIC—

Auto peelings, No. 1 .....	lb.	.07	@ .08
No. 2 .....	lb.	.05	@ .05½
Bicycle .....	lb.	.03	@ .03½
Standard white auto .....	lb.	.04½	@ .05
Standard mixed auto .....	lb.	.04	@
Stripped, unguaranteed .....	lb.	.03	@
White, G. & G., M. & W., and U. S. ....	lb.	.05	@ .05½

## SOLID—

Carriage .....	lb.	.04	@ .04½
Irony .....	lb.	.01	@
Truck .....	lb.	.03½	@ .04½

## THE MARKET FOR COTTON AND OTHER FABRICS.

## NEW YORK.

IN THE FIRST WEEK of September there was a sharp decline in middling spot cotton from 32.05 cents to 28.85 cents, the lowest point it reached. It hovered around 29 cents for another week, then rose to a week's variations around 30 cents, and in the last week of the month rose sharply to 31.60 cents.

The Government's estimate of the crop, which in August was 11,640,000 round bales, fell to 11,230,000 round bales in

September and conservative observers expect it to fall below the 11,000,000 mark in the next report, owing to the prevailing wet weather and the ravages of insect pests, making the fifth consecutive year of short crops.

The market is very firm, the strong demand coming not only from Americans but also from Japanese and English buyers, the latter having to make up in some way the deficiency in Egyptian cotton. If Germany can obtain the necessary credits, it is predicted that the price of cotton will rise at once to 40 cents.

EGYPTIAN COTTON. Although obtainable, it is difficult to get because the American buyer must contend with the English and Continental competition, for England must have long-staple cotton if the mills that make many of her staple fabrics are to reopen. This year's crop of Egyptian is estimated at 6,250,000 cantars or 860,000 bales of 720 pounds each and the latest reports are favorable, the boll worm having done less damage than usual. The yield of Sakellaridis and of upper Egyptian is expected to be about 20 per cent above the average and the same holds good for Afifi. Several cargoes of Egyptian cotton have arrived lately in this country. The prices quoted are for Sakellaridis, low grade 52 cents, medium grade 57 cents, high grade 63 cents; for upper Egyptian, low grade 49 cents, medium grade 51 cents, high grade 53 cents.

SEA ISLAND COTTON. Manufacturers have been forced to throw this out of account, practically, owing to the disasters to the crop. In three consecutive years the crop had dropped to nearly one-half of the normal quantity; this year it has shriveled to probably less than 20,000 bales. Manufacturers have been forced to turn elsewhere for their long-staple cotton, and have found some relief from Egypt, from Arizona and from Peru.

AMERICAN EGYPTIAN. The Arizona cotton, while it will not make up for the shortage in other long-staple varieties, will be the largest crop yet produced, from 45,000 to 50,000 bales. There was an active demand for Pima cotton when dealings in the new crop began; for October-December shipments the price for cotton an inch and three-quarters in staple was 67 to 68 cents, with every indication that the mills are substituting it for Sea Island for which a higher price is asked.

TIRES. The market is very strong, the product of the mills has been sold in many cases for a year ahead and the factories are working to their limit. It is estimated that the output of tires for the coming year will be between 35,000,000 and 40,000,000. The manufacturers are hampered by the shortage in long-staple cotton and many object to using peelers as a substitute.

OTHER FABRICS. The market for belting and hose is quiet. There is an improved demand for lighter ducks and drills, particularly 46 inches and wider; the manufacturers of rubber goods show more concern about securing supplies than about the price. There is a very strong demand for sheetings which are sold practically to the end of 1920; the same holds good for carriage cloth. There is little demand for Osnaburgs or for general cotton goods, but the tone of the market is better than it was a month ago.

## NEW YORK QUOTATIONS.

SEPTEMBER 25, 1919.

Prices subject to change without notice.

## ASBESTOS CLOTH:

Brake lining, 2½ lbs. sq. yd., brass or copper insertion .....	lb.	.85	@
2½ lbs. sq. yd., brass or copper insertion .....	lb.	.90	@

## BURLAPS:

32—7-ounce .....	100 yards	12.50	@
32—8-ounce .....		13.50	@
40—7½-ounce .....		14.15	@
40—8-ounce .....		14.25	@

**BURLAPS:**

40—10-ounce .....	100 yards	18.00	@
40—10½-ounce .....		18.25	@
45—7½-ounce .....		16.85	@
45—8-ounce .....		17.00	@
45—9½-ounce .....		None	
48—10-ounce .....		20.00	@

**DRILLS:**

38-inch 2.00-yard .....	yard	.35	@
40-inch 2.47-yard .....		.28¾	@
52-inch 1.90-yard .....		.46¾	@
52-inch 1.95-yard .....		.46¾	@
60-inch 1.52-yard .....		.60	@

**DUCK:****CARRIAGE CLOTH:**

38-inch 2.00-yard enameling duck .....	yard	.35½	@
38-inch 1.74-yard .....		.40¼	@
72-inch 16.66-ounce .....		.88½	@
72-inch 17.21-ounce .....		.91¾	@

**MECHANICAL:**

Hose .....	pound	.65	@
Belting .....		.65	@

**HOLLANDS, 40-INCH:**

Acme .....	yard	.30	@
Endurance .....		.38	@
Penn .....		.46	@

**OSNABURGS:**

40-inch 2.35-yard .....	yard	.27½	@
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**OSNABURGS:**

40-inch 2.48-yard .....	yard	.26¼	@
37½-inch 2.42-yard .....		.26¾	@

**RAINCOAT FABRICS:****COTTON:**

Bombazine 64 x 60 water-repellent .....	yard	.21	@
60 x 48 not water-repellent .....		.18	@
Cashmeres, cotton and wool, 36-inch, tan .....		.81½	@
Twills 64 x 72 .....		.40	@
64 x 102 .....		.42	@
Twill, mercerized, 36-inch .....		.42½	@ .45
Tweed .....		.55	@ .70
printed .....		.20	@ .25
Plaids 60 x 48 .....		.19	@
56 x 44 .....		.18	@
Repp .....		.42	@ .49
Surface prints 60 x 48 .....		.21	@
64 x 60 .....		.22	@

**IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING****—PLAIN AND FANCIES:**

63-inch, 3¼ to 7½ ounces .....	yard	1.30	@ 3.50
36-inch, 2¾ to 5 ounces .....		.75	@ 1.90

**IMPORTED PLAID LINING (UNION AND COTTON):**

63-inch, 2 to 4 ounces .....	yard	.90	@ 1.85
36-inch, 2 to 4 ounces .....		.55	@ 1.10

**DOMESTIC WORSTED FABRICS:**

36-inch, 4¼ to 8 ounces .....	yard	.65	@ 1.20
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**DOMESTIC WOVEN PLAID LININGS (COTTON):**

36-inch, 3¾ to 5 ounces .....	yard	.21	@ .32
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**SHEETINGS:**

40-inch, 2.35-yard .....	yard	.31¼	@
40-inch, 2.50-yard .....		.29¾	@
40-inch, 2.70-yard .....		.27¼	@
46-inch, 2.85-yard .....		.26	@
40-inch, 3.15-yard .....		.27¼	@
40-inch, 3.60-yard .....		.23¼	@

**JACKET:**

Delaware .....	yard	.30	@
Schuylkill .....	yard	.37	@

**SILKS:**

Canton, 38-inch .....	yard	.52¼	@
Schappe, 36-inch .....		.72¼	@

**TIRE FABRICS:**

17¼-ounce Sea Island, combed .....	pound	1.45	@
17¼-ounce Egyptian, combed .....		1.20	@
17¼-ounce Egyptian, carded .....		*1.12	@
17¼-ounce Peelers, combed .....		*1.18	@
17¼-ounce Peelers, carded .....		.95	@

\*Nominal.

**EGYPTIAN COTTON CROP MOVEMENT.**

FROM AUGUST 1 TO AUGUST 6, 1919.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool .....	bales 580	.....	.....
Manchester .....	.....	2,317	.....
Total shipments to Great Britain...	580	2,317	.....
To Italy .....	.....	.....	1,171
Total shipments to Continent.....	.....	.....	1,171
To United States .....	3,751	.....	.....
Japan .....	.....	2,050	.....
Total shipments to all parts.....	4,331	4,367	1,171
Total crop (interior gross weight), cantars <sup>1</sup> .....	.....	.....	6,315,841

<sup>1</sup> A cantar equals 98 pounds.

(Compiled by Davies, Benachi &amp; Co.)

# TIRE FABRICS

## JENCKES SPINNING COMPANY

PAWTUCKET  
RHODE ISLAND

AKRON OFFICE  
407 Peoples Savings & Trust  
Co. Building.



# THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

## NEW YORK.

THE PAST MONTH has been characterized by the brisk demand for chemicals and compounding ingredients that was noted for the month previous. The outlook is favorable for a continuation of active business in all lines.

ANILINE OIL.—There is a scarcity in supply of this material and the price is maintained at 28 cents per pound.

BARYTES.—The demand has been very good. Prices are steady at \$21 to \$21.50 per ton.

BENZOL.—The market is firm and production has been sold in advance at some sources.

DRY COLORS.—The market has improved to a condition of very good demand in standard colors.

LITHARGE.—In common with other lead products consumers' business has been very active.

LITHOPONE.—Despite the brisk demand, some makers are operating at less than full capacity because of scarcity of labor.

MINERAL RUBBER.—Assured business for this staple ingredient has led to an increase of tonnage and brands available and the development of an export trade in the material.

SUBLIMED LEAD.—The same conditions of active consumers demand in this as in other lead products are taxing producers' facilities of output and sustaining firm prices.

WHITING.—There is not an oversupply and prices are steady.

ZINC OXIDE.—The demand and prices remain steady.

## NEW YORK QUOTATIONS.

SEPTEMBER 25, 1919.

Subject to change without notice.

### ACCELERATORS, ORGANIC.

Accelerator, N. C. C.	lb.	50	@
Accelerene	lb.	3.70	@
Accelomal	lb.	.55	@
Aldehyde ammonia crystals	lb.	1.00	@ 1.25
Aniline oil	lb.	.30	@
Excellerex	lb.	.85	@
Hexamethylene tetramine (powdered)	lb.	.93	@ 1.05
Paraphenylenediamine	lb.	3.50	@
Thiocarbamide	lb.	.50	@

### ACCELERATORS, INORGANIC.

Lead, dry red (bbls.)	lb.	10 1/4	@
sublimed blue (bbls.)	lb.	.08 1/4	@
sublimed white (bbls.)	lb.	.08 1/4	@
white, basic carbonate (bbls.)	lb.	.09	@
Lime, flour	lb.	.02	@
Litharge, domestic	lb.	.09 1/4	@
sublimed	lb.	.10	@
Magnesium, carbonate	lb.	.12 1/4	@
calcined heavy (Thistle)	lb.	.11	@
light (Manhattan)	lb.	.35	@
Magnesium oxide	lb.	.65	@
Magnesite	lb.	.04	@

### ACIDS.

Acetic, 28 per cent (bbls.)	lb.	.03	@
glacial, 99 per cent (carboys)	lb.	.12	@
Cresylic (97% straw color)	gal.	.90	@
(95% dark)	gal.	.85	@
Muriatic, 20 degrees	cwt.	1.75	@ 2.00
Nitric, 36 degrees	lb.	.06	@ .06 1/4
Sulphuric, 66 degrees	lb.	.02	@ .02 1/4

### ALKALIES.

Caustic soda, 76 per cent (bbls.)	lb.	.04 1/4	@
Soda ash (bbls.)	lb.	.03 1/4	@

### COLORS.

Black:			
Bone, powdered	lb.	.05	@
granulated	lb.	.09	@
Carbon black (sacks, factory)	lb.	.12	@
Drop	lb.	.10	@
Ivory black	lb.	.17	@
Lampblack	lb.	.16	@
Oil soluble aniline	lb.	*.40	@
Rubber black	lb.	.07	@
Blue:			
Cobalt	lb.	.25	@ .35
Prussian	lb.	.65	@ .75
Ultramarine	lb.	.18	@ .40
Brown:			
Iron oxide	lb.	.04	@ .06
Sienna, Italian, raw and burnt	lb.	.06	@ .12
Umber, Turkey, raw and burnt	lb.	.05 1/4	@ .07
Vandyke	lb.	.02 1/4	@ .03 1/4
Green:			
Chrome, light	lb.	.35	@ .40
medium	lb.	.40	@ .50
dark	lb.	.50	@ .60
commercial	lb.	.07	@ .15
Oxide of chromium (casks)	lb.	.75	@ .85
Red:			
Antimony, crimson, sulphuret of (casks)	lb.	.48	@
Antimony, golden sulphuret of (casks)	lb.	.24	@
golden sulphuret (States)	lb.	.28	@
red sulphuret (States)	lb.	.25	@
vermillion sulphuret	lb.	.55	@
Arsenic, red sulphide	lb.	.24	@
Indian	lb.	.14	@ .16
Toluidine toner	lb.	4.00	@ 4.50
Iron oxide, reduced grades	lb.	.14	@
pure bright	lb.	.16	@
Spanish	lb.	.04 1/4	@ .05
Venetian	lb.	.02	@ .04 1/4
Oil soluble aniline, red	lb.	*1.80	@
orange	lb.	*1.25	@
Oximony	lb.	.18	@
Vermilion, English, pale, medium, dark	lb.	.35	@ .40
artificial	lb.	1.70	@
White:			
Aluminum bronze, C. P.	lb.	.58	@
superior	lb.	.55	@
Lithopone, domestic	lb.	.06 1/4	@ .07
Ponolith (carloads, factory)	lb.	*.07	@ .07 1/4
Rubber-makers' white	lb.	*.06 1/4	@ .06 1/4
Zinc oxide, Horsehead (less carload, factory):			
"XX red"	lb.	.09 1/4	@
"Special"	lb.	.09 1/4	@
French process, red seal	lb.	.09 1/4	@
green seal	lb.	.10 1/4	@
white seal	lb.	.11 1/4	@
(States)	lb.	.08 1/4	@
Azo, ZZZ, lead free (less carload factory)	lb.	.09 1/4	@
ZZ, under 5% leaded (less carload factory)	lb.	.08 1/4	@
Z, 8-10% leaded (less carload factory)	lb.	.08 1/4	@
Yellow:			
Cadmium, sulphide, yellow, light, orange	lb.	2.00	@
red	lb.	1.85	@
Chrome, light and medium	lb.	.27	@
Ochre, domestic	lb.	.02 1/4	@ .04
imported	lb.	.04 1/4	@ .06
Oil soluble aniline	lb.	*1.20	@
Zinc chromate	lb.	.45	@ .48

### COMPOUNDING INGREDIENTS.

Aluminum flake	ton	28.00	@
Aluminum oxide	lb.	*.18	@
Ammonia carbonate, powdered	lb.	.13 1/4	@ .14
Asbestine (carloads)	ton	25.00	@
Asbestos (bags)	ton	35.00	@
Avoilas compound	lb.	.15	@
Barium, carbonate, precipitated	ton	65.00	@
sulphide, precipitated	lb.	.07 1/4	@
dust	lb.	.03 1/4	@
Barytes, pure white	ton	33.50	@

Barytes, off color.....	ton	18.00	@20.00
uniform floated.....	ton	33.00	@
Basofor.....	lb.	.04	@
Blanc fixe.....	lb.	.04	@
Bone ash.....	lb.	.05	@
Chalk, precipitated, extra light.....	lb.	.05	@ .05½
precipitated, heavy.....	lb.	.04	@ .04½
China clay, domestic.....	ton	8.50	@20.00
imported.....	ton	18.00	@23.50
Shawnee.....	ton	15.60	@
Cork flour.....	lb.	.53	@
Cotton linters, clean mill run, f. o. b. factory.....	lb.	.04	@
Fossil flour (powdered).....	ton	60.00	@
(bolted).....	ton	65.00	@
Diatomite.....	lb.	.03	@
Glue, high grade.....	lb.	.35	@ .40
medium.....	lb.	.16	@ .28
low grade.....	lb.	.12	@ .15
Graphite, flake (400-pound bbl.).....	lb.	.10	@ .25
amorphous.....	lb.	.04	@ .08
Ground glass FF. (bbls.).....	lb.	.03	@
Infusorial earth (powdered).....	ton	60.00	@
(bolted).....	ton	65.00	@
Liquid rubber.....	lb.	.16	@
Mica, powdered.....	lb.	.04	@ .06
Pumice stone, powdered (bbl.).....	lb.	.05	@
Rotten stone, powdered.....	lb.	.02½	@ .04½
Rub-R-Glu.....	lb.	*.20	@ .25
Silex (silica).....	ton	22.00	@40.00
Starch, powdered soap (carload, bbls.).....	cwt.	5.48	@
(carload, bags).....	cwt.	5.84	@
Talc, powdered soapstone.....	ton	25.00	@30.00
Tripoli earth, air-floated.....	ton	25.00	@
Tyre-lith.....	ton	85.00	@
Whiting, Albs (carloads).....	cwt.	.80	@ .90
Columbia.....	cwt.	.80	@
commercial.....	cwt.	1.25	@ 1.30
English cliffstone.....	cwt.	1.70	@ 2.00
gilders.....	cwt.	1.30	@ 1.35
Paris, white, American.....	cwt.	1.50	@ 1.75
Quaker.....	cwt.	.70	@ .80
Wood pulp, imported.....	lb.	.03½	@
Wood flour, American.....	lb.	.01½	@

## MINERAL RUBBER.

Gilsonite.....	ton	57.50	@
Genasco (carloads factory).....	ton	55.00	@
(less carloads factory).....	ton	57.00	@
Hard hydrocarbon.....	ton	30.00	@
K-X.....	ton*120.00	@	
K. M. R.....	ton	*40.00	@60.00
M. R. X.....	ton	100.00	@
Pioneer, carload, factory.....	ton	50.00	@
less carload, factory.....	ton	55.00	@
Raven M. R.....	ton	.50	@ .70
Refined Elaterite.....	ton	175.00	@
Richmond.....	ton	75.00	@
No. 64.....	ton	44.00	@
318/320 M. P. hydrocarbon.....	ton	50.00	@
Robertson M. R. Special (carloads, factory).....	ton	80.00	@
M. R. (carloads, factory).....	ton	55.00	@60.00
Rubpron (carloads, factory).....	ton	50.00	@
(less car, factory).....	ton	60.00	@
Walpole rubber flux (factory).....	lb.	.05	@

## OILS.

Castor, No. 1, U. S. P.....	lb.	.22	@
No. 3, U. S. P.....	lb.	.20	@
Corn, refined Argo.....	cwt.	25.56	@
Cotton.....	lb.	.24	@
Glycerine (98 per cent).....	lb.	.21	@
Glycerole.....	lb.	.55	@
Linseed, raw (carloads).....	gal.	1.90	@
Linseed compound.....	gal.	*.85	@
Palm (Niger).....	lb.	.17	@
Peanut.....	lb.	.27	@
Petrolatum.....	lb.	.06	@
Petroleum grease.....	lb.	.04½	@
Pine, steam distilled.....	gal.	.85	@
Rapeseed, refined.....	gal.	1.60	@
blown.....	gal.	1.65	@
Rosin.....	gal.	.95	@
Soya bean.....	lb.	.18	@
Tar.....	gal.	.34	@

## RESINS AND PITCHES.

Castella gum.....	lb.	.55	@
Tar, retort.....	bbl.	14.50	@
kiln.....	bbl.	13.50	@
Fitch, Burgundy.....	lb.	.09	@
coal tar.....	lb.	.075	@
pine tar.....	lb.	.04	@
ponto.....	lb.	.14	@
Resin, Pontianak, refined.....	lb.	None	
granulated.....	lb.	None	
fused.....	lb.	None	
Rosin, K.....	bbl.	20.90	@
Shellac, fine orange.....	lb.	1.30	@

## SOLVENTS.

Acetone (98.99 per cent drums).....	lb.	.15	@
methyl (drums).....	gal.	1.10	@
Benzol, water white.....	gal.	.24	@
Beta-naphthol, resublimed.....	lb.	.98	@
ordinary grade.....	lb.	.49	@
Carbon bisulphide (drums).....	lb.	.06½	@ .07
tetrachloride (drums).....	lb.	.11	@
Naphtha, motor gasoline (steel bbls.).....	gal.	.24½	@
73 @ 76 degrees (steel bbls.).....	gal.	None	
68 @ 70 degrees (steel bbls.).....	gal.	None	
Solvent.....	gal.	.20	@
V. M. & P. (steel bbls.).....	gal.	.23½	@
Toluol, pure.....	gal.	.26	@
Turpentine, spirits.....	gal.	1.71	@
wood.....	gal.	1.65	@
Osmaco reducer.....	gal.	.30	@
Xylol, pure.....	gal.	.35	@ .40
commercial.....	gal.	.30	@ .35

## SUBSTITUTES.

Black.....	lb.	.10½	@ .20
White.....	lb.	.12½	@ .23
Brown.....	lb.	.15	@ .23
Brown factice.....	lb.	.09	@ .22
White factice.....	lb.	.11	@ .23
Paragol soft and medium (carloads).....	cwt.	18.58	@
hard.....	cwt.	18.08	@

## VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo).....	lb.	.52	@ .56
Orange mineral, domestic.....	lb.	.13½	@
Sulphur chloride (drums).....	lb.	.20	@
Sulphur, flour, Brooklyn brand (carloads).....	cwt.	3.15	@
pure soft (carloads).....	cwt.	3.15	@
superfine (carloads, factory).....	cwt.	2.50	@

(See also Colors—Antimony)

## WAXES.

Wax, beeswax, white.....	lb.	.70	@
ceresin, white.....	lb.	.15	@ .18
carnauba.....	lb.	.55	@ .60
ozokerite, black.....	lb.	.60	@
green.....	lb.	None	
montan.....	lb.	*.50	@
substitute.....	lb.	.25	@ .40
paraffine, refined 118/120 m. p. (cases).....	lb.	.07½	@
123/125 m. p. (cases).....	lb.	.07½	@
128/130 m. p. (cases).....	lb.	.08½	@

\*Nominal.

## THE INTERNATIONAL FLOOR MACHINE.



RUBBER-TILING BUFFER.

Interlocking rubber tiling is the accepted floor covering for the salons, passageways and cabins of ocean liners. Modern hotels, banks and hospitals have adopted this form of floor covering for special purposes and usually in preference to all others.

The final process of making rubber tiling is buffing, in order to remove any surface inequalities, and the machine here shown is obviously adaptable for this purpose. The grinder disks are motor-driven by the current from any convenient lamp socket. The machine is self-propelled and is guided over the surface by exerting a slight pressure upward or downward on the handle. (International Floor Machine Co., 149-151 West 36th street, New York City.)



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